ISAAC NEWTON,

THE 机械宇宙

CLOCKWORK

THE ROYAL SOCIETY,

UNIVERSE

AND THE BIRTH OF THE MODERN WORLD

艾萨克·牛顿、皇家学会与现代世界的诞生

〔美〕爱德华·多尼克（Edward Dolnick）/ 著

黄珮玲 / 译

社会科学文献出版社
SOCIAL SCIENCES ACADEMIC PRESS (CHINA)

[illegible]

·1543[illegible]On the Revolutions of the Celestial Spheres[illegible]
·1564[illegible]·[illegible]
·1564[illegible]
·1571[illegible]·[illegible]
·1600[illegible]
·1609[illegible]
·1610[illegible]
·1616[illegible]
·1618[illegible]1648[illegible]
·1619[illegible]
·1630[illegible]
·1633[illegible]
·1637[illegible]“[illegible]”[illegible]I think, therefore I am[illegible]
·1642[illegible]1651[illegible]
·1642[illegible]
·1642[illegible]·[illegible]
·1646[illegible]·[illegible]
·1649[illegible]
·1660[illegible]
·1664[illegible]1666[illegible]“[illegible]”[illegible]miracle years[illegible]
·1665[illegible]
·1666[illegible]
·1674[illegible]“[illegible]”[illegible]little animals[illegible]
·1675[illegible]
·1675[illegible]1676[illegible]“[illegible]”[illegible]

·1684□　□□□□□□□□□□□□

·1684□　□□□Halley□□□□□□□□□

·1687□　□□□□□□□□□Principia□□□[注]□□□“□□□□”□

·1696□　□□□□□□□□□□

·1699□1722□　□□□

·1704□　□□30□□□□□□□□□□□□□□□□

·1705□　□□□□□□□

·1716□　□□□□□□□□□□□□□□□□□□□□□□□□□

·1727□　□□□□□

1. □□□□□□□□□□□□□□□□□□□□□*Philosophiae Naturalis Principia Mathematica*□

[illegible]

[illegible]17[illegible]“[illegible]”（Age of Genius）[illegible]“[illegible]”（Age of Tumult）[illegible]（Linkboy）[注][illegible]5[illegible][引]

[illegible][引][illegible]“[illegible]”[illegible][引][illegible][引]1599[illegible]（Globe Theatre）[illegible]2000[illegible][引][illegible]1715[illegible][引]

[illegible][注][illegible]

[illegible]1649[illegible]17[illegible]50[illegible]1665[illegible]

[illegible]

[illegible]——[illegible]“[illegible]”[illegible]·[illegible]·[illegible]（Alfred North Whitehead）[注][illegible]“[illegible]”[引][illegible]“[illegible]”[illegible]

[illegible]17[illegible]

[illegible]

[illegible]·[illegible]“[illegible]”[illegible]universal law[illegible]17[illegible]

[illegible]1687[illegible]

[illegible]

1. [illegible]
2. Manuel Eisner,“Modernization, Self-Control, and Lethal Violence. The Long-Term Dynamics of European Homicide Rates in Theoretical Perspective,”*British Journal of Criminology* 41, no. 4 (2001).
3. Barbara Freese, *Coal*: *A Human History* (New York: Penguin, 2004), p. 35, quoting John Evelyn.
4. J. H. Plumb, *The First Four Georges* (London: Fontana, 1981), p. 17.
5. Emily Cockayne, *Hubbub*: *Filth, Noise, and Stench in England*, p. 93.
6. Gregory Clark, *A Farewell to Alms*: *A Brief Economic History of the World* (Princeton, NJ: Princeton University Press, 2007), p. 107.
7. Katherine Ashenburg*, The Dirt on Clean*, p. 116.
8. [illegible]·[illegible]Jules Michelet[illegible]“[illegible]”[illegible]Ashenburg, *The Dirt on Clean*[illegible]p. 12.[illegible]

[illegible]4[illegible]·[illegible]1798– 1874[illegible]“[illegible]”[illegible]

9. [illegible]·[illegible]·[illegible]1861[illegible]1947[illegible]20[illegible]“Men expected the sun to rise, but the wind bloweth where it listeth”[illegible]

10. Alfred North Whitehead, *Science and the Modern World*, p. 5.

[illegible]

[illegible]·[illegible]（Thomas Gresham）[注][illegible]

[illegible]——[illegible]·[illegible]（Oliver Cromwell）[注][illegible]

[illegible]

[illegible]·[illegible]（Robert Boyle）[注][illegible][注][illegible][引][illegible]

[illegible]·[illegible]（Robert Hooke）[注][illegible]——“[illegible]”[引]——[illegible]

[illegible]·[illegible]（Christopher Wren）[illegible]“[illegible]”（miracle of youth）[引][illegible]91[illegible]（St. Paul’s Cathedral）[illegible]

[illegible]（The Royal Society of London for the Improvement of Natural

Knowledge[illegible]The Royal Society[illegible]“[illegible]”[illegible]——[illegible]

[illegible]——[illegible]·[illegible]——[illegible]

[illegible]1660[illegible]17[illegible]

[illegible]“[illegible]”[引][illegible]84[illegible]

[illegible]

[illegible]

1. [illegible]·[illegible] 1558[illegible]“[illegible]”[illegible]Bad money drives out good[illegible]“[illegible]”[illegible]“[illegible]”[illegible]
2. [illegible]·[illegible]1599–1658[illegible]1658[illegible]1660[illegible]
3. [illegible]·[illegible]1627[illegible]1691[illegible]“[illegible]”[illegible]
4. Steven Shapin, *A Social History of Truth*. Shapin devotes a fascinating chapter to the riddle of “Who Was Robert Boyle?”
5. Lisa Jardine, *On a Grander Scale*, p. 194.

6. [illegible]·[illegible]1635[illegible]1703[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]
7. Leo Hollis, *London Rising*, p. 48.
8. Jardine, *On a Grander Scale*, p. 236, quoting John Evelyn.
9. John Maynard Keynes, “Newton, the Man,” p. 278, quoting the Cambridge mathematician William Whiston.

[illegible]

[illegible]17[illegible][注]“[illegible]”[illegible]“[illegible]”[引][illegible][引][illegible]

[illegible][引][illegible]“[illegible]”[illegible][引]1699[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]1717[illegible]“[illegible]”[引]

[illegible]1685[illegible]“[illegible]”[illegible]“[illegible]”[illegible][引][illegible]“40[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]

[illegible]1493[illegible]

[illegible]17[illegible]“[illegible]”[illegible]acts of God[illegible]17[illegible]

***

[illegible]

[illegible]“[illegible]”[illegible]damn[illegible]“[illegible]”[illegible]hell[illegible]being damned to hell[illegible]“[illegible]”[illegible]·[illegible]Morris Kline[illegible][注][illegible]“[illegible]

[illegible]”[引]

[illegible]

1662[illegible]*The Day of Doom*[illegible]

[illegible],
[illegible]
[illegible]
[illegible]

[illegible]18[illegible]1741[illegible]·[illegible]Jonathan Edwards[illegible][注][illegible]“[illegible]”[illegible]Sinners in the Hands of an Angry God[illegible]“[illegible]”

[illegible]“[illegible]”[引][illegible]·[illegible]John Donne[illegible][注][illegible]1662[illegible]19[illegible]·[illegible]58[illegible]——“[illegible]”[引]——[illegible]“[illegible]”“[illegible]”“[illegible]”“[illegible]”“[illegible]”[illegible]

[illegible]17[illegible]·[illegible]Isaac Watts[illegible]——[illegible]*Joy to the World*[illegible]——[illegible][注][illegible]

I am a vile polluted lump of earth

So I’ve continued ever since my birth

Although Jehovah grace does daily give me

As sure this monster Satan will deceive me

Come therefore, Lord, from Satan’s claws relieve me

Watts

1. “”scientist
19 17 “” natural philosophers “” virtuosos
2. Peter Earle, *The Making of the English Middle Class: Business, Society and Family Life in London 1660–1730* (Berkeley: University of California Press, 1989), p. 302.
3. Keith Thomas, *Religion and the Decline of Magic*, p. 5.
4. A. Lloyd Moote and Dorothy Moote, *The Great Plague*, p. 26.
5. Anna Beer, *Milton*, p. 386.
6. Earle, *The Making of the English Middle Class*, p. 302.
7. T. B. Macaulay, *History of England*, ch. 4, “James the Second,” available at http://www.strecorsoc.org/macaulay/m04a.html. I drew details from Macaulay’s *History*; Antonia Fraser’s *Royal Charles*, p. 446; and an account by the king’s chief physician, Sir Charles Scarburgh, at http://tinyurl.com/y3wgtom.
8. Adam Nicolson, *God’s Secretaries* (New York: Harper, 2005), p. 25.
9. · 1908 1992
10. Morris Kline, *Mathematics in Western Culture*, p. 235.

11. [illegible]·[illegible]1703[illegible]1758[illegible]
12. Eugen Weber, *Apocalypses*, p. 100.
13. [illegible]·[illegible]1572[illegible]1631[illegible]17[illegible]
14. Richard Westfall includes the entire list in his “Writing and the State of Newton’s Conscience.”
15. [illegible]·[illegible]“ISAAC”[illegible]Isaac[illegible]
16. Roy Porter, *The Creation of the Modern World*, p. 157.

[illegible]

[illegible]17[illegible]50[illegible]60[illegible]

[illegible]Apocalypse[illegible]

[illegible]“[illegible]”[illegible]

[illegible]*New Yorker*[illegible]“[illegible]”[illegible]the end is nigh![illegible]17[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]——1260[illegible]——[illegible]1260[illegible]400[illegible]“[illegible]”[illegible]great apostasy[illegible]·[illegible]400[illegible]1260[illegible] 1660[illegible]

[illegible]“[illegible]”

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]1649[illegible]

1660[illegible][引][illegible]“[illegible]”[illegible]Merrie Monarch[illegible]

[illegible]1662[illegible]

[illegible]1664[illegible]17[illegible] disgrace[illegible]disfavor[illegible]disaster[illegible]dis[illegible]astrum[illegible]“[illegible]”1528[illegible]“[illegible]……[illegible]”[引]

[illegible]“[illegible]……[illegible]”[illegible]·[illegible]“[illegible]”[引]

[illegible]

1664[illegible] 11[illegible]12[illegible]12[illegible]17[illegible]1[illegible]——[illegible]“[illegible]”[illegible][引]

[illegible]·[illegible]John Gadbury[illegible]“[illegible]”[引][illegible]“[illegible]”[illegible]

1665[illegible]3[illegible]

[illegible]——[illegible][引]——[illegible]“[illegible]”[illegible][引]

[illegible]·[illegible][注][illegible]17[illegible]

[illegible]·[illegible][引][illegible]30[illegible]

[illegible]——[illegible]——[illegible]“[illegible]……[illegible]”[illegible]“[illegible]”[引]

***

[illegible]1666[illegible]666[illegible]1665[illegible]

1. Perry Miller,“The End of the World,”p. 171.
2. Frank Manuel, *A Portrait of Isaac Newton*, p. 129.
3. [illegible]·[illegible]“MDCLXVI”[illegible]1666[illegible]“[illegible]”[illegible]Adrian Tinniswood, *His Invention So Fertile: A Life of Christopher Wren*, p. 17.
4. [illegible]11[illegible]3[illegible]“[illegible]”[illegible]
5. [illegible]“[illegible]”[illegible]

[illegible]

6. Richard Westfall, *Never at Rest*, p. 321.
7. Matthew 24:3, King James Bible.
8. Lawrence Stone, *The Family, Sex, and Marriage*, p. 328.
9. *David Levy's Guide to Observing and Discovering Comets* (New York: Cambridge University Press, 2003), p. 9, quoting Ambroise Pare.
10. Tinniswood, *His Invention So Fertile*, p. 10, quoting Andreas Celichius.
11. Ibid.,p. 11.
12. Moote and Moote, *The Great Plague*, p. 20.
13. J. Fitzgerald Molloy, *Royalty Restored* (London: Downey, 1897), p. 167.
14. Neil Hanson, *The Great Fire of London*, p. 28.
15. [illegible]"the gospel of the Prince of Peace"[illegible]
16. Westfall, *Science and Religion in Seventeenth-Century England*, p. 124. The historian Frank Manuel discusses Boyle's belief in the imminence of the apocalypse in *Portrait of Isaac Newton*, p. 129.
17. Isaac Newton, *Observations upon the Prophecies of Daniel, and the Apocalypse of St. John*, part 1, ch. 4, "Of the vision of the four Beasts." This posthumous work by Newton can be found, along with seemingly everything else Newton-related, at the indispensable Newton Project website, http://www.newtonproject.sussex.ac.uk/prism.php?id=1. This essay is at http://www.newtonproject.sussex.ac.uk/view/texts/normalized/THEM00198.

[illegible]

[illegible]1347[illegible]1350[illegible]

[illegible]“[illegible]”[illegible][引][illegible]“[illegible]”[illegible]Petrarch[illegible][注][illegible]“[illegible]”[引]

[illegible]17[illegible]1625[illegible]

[illegible]——[illegible]17[illegible]17[illegible]50[illegible]60[illegible]1663[illegible]1664[illegible]

1664[illegible]——[illegible]2[illegible]4[illegible] 1665[illegible]4[illegible]30[illegible]·[illegible]Samuel Pepys[illegible][注][illegible]30[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]“[illegible]”[illegible][注]

[illegible]“[illegible]”[引][illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[注][illegible]1625[illegible]“[illegible]”[illegible]

[illegible]“[illegible]……[illegible]”[illegible]

[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

1665[illegible]6[illegible]7[illegible]“[illegible]”[illegible]6[illegible]10[illegible]6[illegible]15[illegible]“[illegible]……[illegible]112[illegible]43[illegible]”[illegible]

[illegible]7[illegible]1[illegible]“[illegible]Bazing-hall street[illegible][注][illegible]”[illegible]7[illegible]13[illegible]“[illegible]700[illegible]”[illegible]

[illegible]“[illegible]”[引][illegible][注][illegible]

[illegible]1665[illegible]6[illegible]7[illegible]8[illegible]6000[illegible]“[illegible]”[illegible]·[illegible]Nathaniel Hodges[illegible]“[illegible]”[引]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]……[illegible]”[illegible][引]

1. Norman Cantor, *In the Wake of the Plague*, p. 8.

2. [illegible]·[illegible]Francesco Petrarca, 1304[illegible]1374[illegible]14[illegible]
3. Barbara Tuchman, *A Distant Mirror* (New York: Ballantine, 1978), p. 99.
4. [illegible]·[illegible]1633[illegible]1703[illegible]1665[illegible]1684[illegible]12[illegible]1[illegible]1686[illegible]11[illegible]30[illegible]1660[illegible]1669[illegible]
5. Samuel Pepys’s diary entry for April 30, 1665, available at http://www.pepysdiary.com.
6. [illegible]——[illegible]“[illegible]”[illegible]“[illegible]”[illegible]
7. Margaret Healy,“Defoe’s *Journal* and the English Plague Writing Tradition,”quoting the seventeenth-century pamphleteer Thomas Dekker.
8. [illegible]Richelle Munkhoff,“Searchers of the Dead: Authority, Marginality, and the Interpretation of Plague in England, 1574–1665,”*Gender and History* 11, no. 1 (April 1999).
9. [illegible]Basinghall[illegible]Bassinghall[illegible]Bassing[illegible]13[illegible]
10. Ibid.
11. [illegible]refuse channels[illegible]
12. Nathaniel Hodge, *Loimolgia*, or *An Historical Account of the Plague in London in 1665.* See http://rbsche.people.wm.edu/H111_doc_loimolgia.html.
13. Pepys’s diary, August 8, 1665.

[illegible]

[illegible]“[illegible]”[引][illegible]1665[illegible]“[illegible]”[引][illegible]“kill all their dogs of what sort or kind before Thursday next at ye furthest”[illegible][注][illegible]

[illegible]——[illegible]——[illegible]

[illegible]7[illegible]“[illegible]”[illegible][引][illegible]8[illegible]“[illegible]”[illegible]“[illegible]”[illegible]8[illegible]6102[illegible]

[illegible]

1665[illegible]9[illegible]“[illegible]”[illegible][引][illegible]·[illegible]“[illegible]”[illegible]

[illegible]——[illegible]“[illegible]7400[illegible] 6000[illegible]”[illegible]“[illegible]20[illegible]10[illegible]12[illegible]”

[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]10[illegible]600[illegible]“[illegible]”[illegible]“[illegible]”

[illegible]1665[illegible]11[illegible]10[illegible]

[illegible]1665[illegible]9[illegible]·[illegible]George Vicars[illegible]350[illegible]267[illegible]

[illegible]1665[illegible]6[illegible]

[illegible]·[illegible]

1. Roger Lund,“Infectious Wit: Metaphor, Atheism, and the Plague in Eighteenth-Century London,”*Literature and Medicine* 22, no. 1 (Spring 2003),p. 51.
2. Moote and Moote, *The Great Plague*, p. 177.
3. [illegible]ye[illegible]the,[illegible]Ye Fox and Hounds Tavern[illegible]y[illegible]th[illegible]f[illegible]s[illegible]
4. Tinniswood, *His Invention So Fertile*, p. 115, quoting Henry Oldenburg, secretary of the Royal Society.
5. Letter written September 4, 1664, by Pepys to Lady Carteret, in *Correspondence of Samuel Pepys*, vol. 5, p. 286. See http://tinyurl.com/y2aqoze.
6. John Kelly, *The Great Mortality*, p. xv.
7. Pepys’s diary, October 16, 1665.
8. Raymond Williamson,“The Plague in Cambridge,”*Medical History* 1, no. 1 (January 1957), p. 51.

[illegible]

[illegible]1666[illegible]

[illegible][引][illegible]“[illegible]”[illegible]

[illegible]——[illegible]

[illegible]·[illegible]“[illegible]”[illegible]second causes[illegible][引][illegible]“[illegible]”[illegible]first cause[illegible]

1666[illegible]9[illegible]2[illegible]·[illegible]Thomas Farriner[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]

[illegible]

[illegible]

[illegible]“[illegible]”[illegible][引][illegible]

[illegible][引]

[illegible]50[illegible]

[illegible]1[illegible]“[illegible]”[illegible][引][illegible][引]

[illegible]“[illegible]”[illegible]·[illegible]John Evelyn[illegible][注][illegible]“[illegible]……[illegible]2[illegible]1[illegible]Sodom[illegible][注][illegible]”[引]

***

[illegible]——[illegible]·[illegible]“[illegible]”[引][illegible]

[illegible]“[illegible]”[illegible][引][illegible]·[illegible]William Taswell[illegible]

[illegible]

[illegible]“[illegible]……”[illegible]“[illegible]”[引]

1. Hanson, *The Great Fire of London*, p. 165, quoting John Evelyn.
2. Moote and Moote, *The Great Plague*, p. 69.
3. Christopher Hibbert, *London* (London: Penguin, 1977), p. 67, and Hanson, *The Great Fire of London*, p. 49.
4. G. M. Trevelyan*, English Social History* (New York: Penguin, 1967), p. 305.
5. Antonia Fraser, *Royal Charles*, p. 245.
6. Pepys's diary, September 2, 1666.
7. Hollis, *London Rising*, p. 121.
8. [illegible]·[illegible]1620[illegible]1706[illegible]·[illegible]17[illegible]·[illegible]Crabtree & Evelyn[illegible]
9. [illegible]
10. John Evelyn, *The Diary of John Evelyn*, vol. 2, p. 12. This is from Evelyn's diary entry for September 3, 1666, available at http://www.pepysdiary.com/indepth/archive/2009/09/02/evelyns-fire.php.
11. *People wandered in search*: Hollis, *London Rising*, p. 122.
12. Hanson, *The Great Fire of London*, p. 163.
13. Ibid., p. xv, quoting from a pamphlet by Thomas Vincent, *God's Terrible Voice in the City*.

[illegible]

[illegible]17[illegible]60[illegible]modern age[illegible]——[illegible]

[illegible]

[illegible]·[illegible]·[illegible]John Ray[illegible][注][illegible]·[illegible][注]

17[illegible]

[illegible]——[illegible]

[illegible]·[illegible]——[illegible]

[illegible]17[illegible]

[illegible][引][illegible]

[illegible]“[illegible]”[illegible]

[illegible]

[illegible]·[illegible]

[illegible]

[illegible]17[illegible][注][illegible]——[illegible]——[illegible]

“[illegible]”[illegible]·[illegible]Alexander Pope[illegible][注][illegible]“[illegible]”[illegible][引][illegible]“[illegible]”[illegible][注][illegible]——[illegible]——[illegible]·[illegible]“[illegible]”[illegible]“[illegible]”[illegible][引]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible][引]

[illegible]17[illegible]God-drenched era[illegible]“[illegible]‘[illegible]’[illegible]‘[illegible]’[illegible]”[illegible]·[illegible]Jacques Barzun[illegible]“[illegible]‘[illegible]’[illegible]

[illegible]reality[illegible]”[引][illegible][注][illegible]“[illegible]”[illegible]

[illegible]17[illegible]·[illegible]Blaise Pascal[illegible][注][illegible]“[illegible]”[illegible][引][illegible]

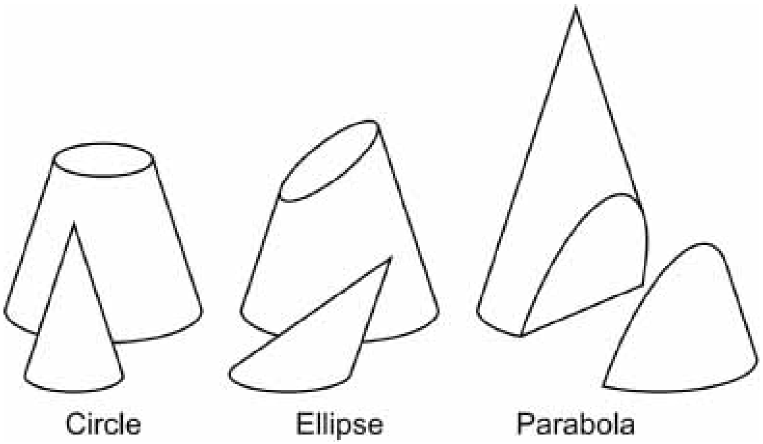
[illegible]——[illegible]

[illegible]——[illegible][注][illegible]10257[illegible]1[illegible]

17[illegible]——2[illegible]2[illegible]4——[illegible]——[illegible]——[illegible]“[illegible]”[illegible]

[illegible]17[illegible]

[illegible]300[illegible]“[illegible]”[illegible][注][illegible]



19[illegible]

[illegible]17[illegible]

[illegible]——[illegible]“[illegible]”[illegible]·[illegible]“[illegible]”

17[illegible]

1. [illegible]·[illegible]1627[illegible]1705[illegible]（*Historia Plantarum*[illegible]
2. [illegible]“[illegible]”[illegible]“[illegible]”[illegible]
3. J. E. McGuire and P. M. Rattansi,“Newton and the ‘Pipes of Pan,’”p. 135. See also Piyo Rattansi,“Newton and the Wisdom of the Ancients,”in John Fauvel et al.,eds.,*Let Newton Be!*, p. 187; Force and Popkin, *Newton and Religion*, p. xvi; Steven Shapin, *The Scientific Revolution*, p. 74.
4. The only challenges to the mainstream view came from the much-feared, much-reviled Thomas Hobbes and Baruch Spinoza.

5. [illegible]·[illegible]1688[illegible]1744[illegible]
6. Pope, “An Essay on Man.”
7. [illegible]“[illegible]”Jane Dunn, *Elizabeth and Mary* (New York: Vintage, 2005),p. 17.
8. Thomas, *Religion and the Decline of Magic*, p. 79.
9. Lorraine Daston and Katharine Park, *Wonders and the Order of Nature, 1150–1750*, p. 296, quoting Walter Charleton, *The Darkness of Atheism Dispelled by the Light of Nature*.
10. Jacques Barzun, *From Dawn to Decadence*, p. 24.
11. [illegible]“[illegible]”[illegible]“[illegible]”[illegible]
12. [illegible]1623[illegible]1662[illegible]
13. Arthur Lovejoy, *The Great Chain of Being*, p.153.
14. [illegible]1823[illegible]21[illegible]Johann Bolyai[illegible]1919[illegible]
15. Morris Kline, *Mathematics*: *The Loss of Certainty*, p. 22. See Plato’s *Laws*, book 11.[illegible]……[illegible]http://classics.mit.edu/Plato/laws.11.xi.html.
16. Richard Westfall, *Never at Rest*, p. 327.

[illegible]

[illegible]·[illegible]·[illegible]1500[illegible]“[illegible]”[illegible]“[illegible]”[引]1662[illegible]·[illegible][引]

[illegible]motion[illegible]

23[illegible]·[illegible]

[illegible]180[illegible][引]

[illegible]

[illegible]

[illegible]“[illegible]”[illegible]“[illegible]17[illegible]”[illegible][引]

[illegible]·[illegible]·[illegible]

[illegible]·[illegible]3[illegible]30[illegible][注][illegible]

[illegible]1727[illegible]84[illegible]“[illegible]”

[illegible]——[illegible]4[illegible]——[illegible]——[illegible]“[illegible]……[illegible]”[illegible]·[illegible]Denis Diderot[illegible]“[illegible]”[引]

[illegible]7[illegible]13[illegible]“[illegible]”[illegible][引]

[illegible]“[illegible]”[引][illegible][引][illegible]

[illegible][引][illegible]——[illegible]17[illegible][引]——[illegible]20[illegible]“[illegible]‘[illegible]’[illegible]”[引][illegible]

□□□“□□□□□”□□“□□□□□□□□□□□□□□”□□□□□□□□□[引]□

“□□□□□□□□□□□□□□□□□□□□□□□□□□□”□□·□□□·□□□（John Maynard Keynes）[注]□□□□□□□□□□□□□□□□□“□□□□□□□□□□□□□□□□□□□□□□□□”[引]□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□“□□,□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□”

□□□□□□□□□□□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□——□□□□□□□□□□□□——□□□□□□□□□□□□□□“□□□□□□□□□□□□□□□□□□□□”□□□□□□□□□□□□□□□“□□□□□□□□□□……□□□□□□□□□□□”[引]□□□□□□□□□□□□□□□□□□□□□□□□□□□“□□□□□□□□□”□□□□□□“□□□□□□□□□□□”□□□□□□□

□□□□□□□□□□□□□□□□□□□

1. John Carey, *John Donne*, p. 128.
2. Pepys's diary, July 4, 1662.
3. Ernst Cassirer, "Newton and Leibniz," p.381. See also Karen Armstrong, *A History of God*, p. 35.
4. I. Bernard Cohen, *Revolution in Science*, p. 90.
5. [illegible]·[illegible]Hannah Newton[illegible]·[illegible]Frank Manuel[illegible]30[illegible]·[illegible]See Manuel, *A Portrait of Isaac Newton*, p. 24.
6. Matthew Stewart, *The Courtier and the Heretic*, p. 12.
7. Daniel Boorstin, *The Discoverers*, p. 414.
8. Stewart, *The Courtier and the Heretic*, p. 43.
9. Bertrand Russell, *A History of Western Philosophy* (New York: Simon & Schuster, 1945), p. 582.
10. Gale Christianson, *Isaac Newton*, p. 65.
11. Peter Ackroyd, *Newton*, p. 98.
12. Milo Keynes,"The Personality of Isaac Newton,"p. 27.
13. Stewart, *The Courtier and the Heretic*, p. 12.
14. Ibid.,p. 53.
15. Philip Wiener,"Leibniz's Project,"p. 234.
16. [illegible]·[illegible]Daniel Schwenter[illegible]1637[illegible]Deliciae physico-mathematicae[illegible]
17. Westfall, *Never at Rest*, p. 103.
18. [illegible]·[illegible]·[illegible]1883[illegible]1946[illegible]"[illegible]"[illegible]
19. John Maynard Keynes,"Newton, the Man,"p. 278.
20. Westfall, *Never at Rest*, p. 94.

[illegible]

[illegible]·[illegible]·[illegible]“[illegible]”[引][illegible]·[illegible]Sir Kinelm Digby[illegible]——“[illegible]”[注][illegible]——[illegible]

[illegible]1660[illegible]10[illegible]“[illegible]”[引][illegible]1660[illegible][引][illegible]

[illegible]1672[illegible]·[illegible][引]

[illegible]“[illegible]”[illegible]“[illegible]·[illegible]Sir William Throgmorton[illegible]”[illegible][引]

[illegible]·[illegible][引]

[illegible]1670[illegible]“[illegible]”[illegible]flying chariot[illegible][引][illegible]“[illegible]”[illegible]

[illegible]·[illegible]“[illegible]”[illegible]“[illegible]”[引][illegible]——[illegible]

[illegible]·[illegible]John Locke[illegible][注][illegible]·[illegible][引]17[illegible]*National Enquirer*[illegible][注][illegible][引][illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]

[illegible]

[illegible]Hanging Days[illegible][注][illegible]24[illegible]“[illegible]”[引][illegible]

[illegible]Tyburn[illegible][注][illegible]

[illegible]“[illegible]”[引][illegible]·[illegible]

[illegible]“[illegible]”[illegible][引]

[illegible]·[illegible]William Harvey[illegible][注][illegible]“[illegible]”[illegible][引]

[illegible]“[illegible]”[illegible]philosopher’s stone[illegible][引][illegible]17[illegible]·[illegible]50[illegible][引][illegible]

[illegible][引][illegible]“[illegible]”[引]

[illegible][引][illegible]——[illegible]“[illegible]”[illegible]“[illegible]”——[illegible]X[illegible][注][illegible]“[illegible]”[illegible]“[illegible]”[illegible][引][illegible]

[illegible]

[illegible]“[illegible]……”[illegible]“[illegible]……”[引]

[illegible]1936[illegible]·[illegible]·[illegible][引][illegible]“[illegible]”[illegible][引]

[illegible]——[illegible]“[illegible]”[illegible]Boyle’s law[illegible]——[illegible]

[illegible]

[illegible]

1. Liza Picard, *Restoration London*, p. 78.
2. [illegible]“[illegible]”[illegible]
3. Charles Richard Weld, *History of the Royal Society* (London: John W. Parker, 1848),v. 1, p. 114.
4. Ibid., p. 113.
5. Robert Crease, *The Prism and the Pendulum*, p. 72.
6. Christopher Hibbert, *London*, p. 100.
7. Stone, *The Family, Sex, and Marriage*, p. 65.
8. Marjorie Nicolson and Nora Mohler,“Swift’s ‘Flying Island' in the *Voyage to Laputa,*”p. 422.
9. John Henry,“Occult Qualities and the Experimental Philosophy,”p. 359.[illegible]·[illegible]
10. [illegible]·[illegible]1632[illegible]1704[illegible]·[illegible]·[illegible]·[illegible]·[illegible]·[illegible]
11. John Locke, *An Essay Concerning Human Understanding*, book 3, ch. 6,“Of the Names of Substances”(London: Thomas Tegg, 1841),p. 315.
12. [illegible]
13. Daston and Park, *Wonders and the Order of Nature*, p. 231.
14. [illegible]
15. Simon Devereaux,“Recasting the Theater of Execution,”*Past & Present* 202, no. 1 (February 2009).
16. [illegible]
17. Hanson, *The Great Fire of London*, p. 216, and Thomas, *Religion and the Decline of Magic*, p. 204.

18. Daston and Park, *Wonders and the Order of Nature*, p. 241.
19. [illegible]·[illegible]1578[illegible]1657[illegible]
20. Thomas, *Religion and the Decline of Magic*, p. 644.
21. Christianson, *Isaac Newton*, p. 55.
22. Rattansi,“Newton and the Wisdom of the Ancients,” p. 193.
23. Stewart, *The Courtier and the Heretic*, p. 48.
24. Christianson, *Isaac Newton*, p. 55.
25. [illegible]Hogwarts[illegible]J. K. [illegible]J. K. Rowling[illegible]·[illegible]*Harry Potter*[illegible]
26. William Newman, Indiana University historian of science, speaking on PBS in a *Nova* program, *Newton’s Dark Secrets*, broadcast November 15, 2005.
27. Jan Golinski,“The Secret Life of an Alchemist,”in *Let Newton Be!*,p. 160.
28. For an excellent, detailed history of Newton’s papers, see http://www.newtonproject.sussex.ac.uk/prism.php?id=23.
29. John Maynard Keynes,“Newton, the Man,”p. 277.
30. Christianson, *Isaac Newton*, p. 55.

[illegible]

[illegible]“Nullius in Verba”[illegible]“[illegible]”[illegible]

[illegible]——[illegible]——[illegible][注][illegible]

[illegible]“[illegible]”[illegible][注][illegible]“[illegible]”[illegible][引][illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[引]——[illegible]——[illegible]“[illegible]”[illegible]“[illegible]”[注][illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible][引][illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]1662[illegible]5[illegible]7[illegible]“[illegible]”[illegible]·[illegible]“[illegible]”

[illegible]“[illegible]”——[illegible]——“[illegible]”[illegible]“[illegible]”[引]

[illegible]1667[illegible]11[illegible]40[illegible]·[illegible]Arthur Coga[illegible]“[illegible]”[引]

[illegible]——[illegible][引][illegible]

[illegible]“[illegible]”[illegible]“[illegible]40[illegible]‘[illegible]’[illegible]”

[illegible]

***

[illegible]·[illegible]

[illegible]

[illegible]“[illegible]”[illegible]originality[illegible]“[illegible]”[illegible]“[illegible]”[illegible]1667[illegible]“[illegible]”[引][illegible]

[illegible]——[illegible][注][illegible]“[illegible]”[引][illegible]

[illegible]·[illegible]Daniel Boorstin[illegible][注][illegible]“[illegible]”[illegible][引][illegible]14[illegible]“[illegible]5[illegible]”[引][illegible]——[illegible]——[illegible]

[illegible]

[illegible]——[illegible]——[illegible]·[illegible]Lorraine Daston[illegible][注][illegible]·[illegible]Katharine Park[illegible][注][illegible]“[illegible]”[illegible][引]

[illegible]“[illegible]”[illegible]——[illegible]“[illegible]”[illegible]

[illegible][引]

[illegible]“[illegible]”[illegible]“[illegible]”[引][illegible]“[illegible]”[illegible][引]

[illegible]“[illegible]”[illegible]Corinthians[illegible][注][illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible][引][illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible][引]

[illegible]·[illegible][注][illegible]“[illegible]”[引][illegible]

[illegible][引]

1. [illegible]
2. [illegible]ceremony[illegible]
3. Tinniswood, *His Invention So Fertile*, p. 79.
4. Marjorie Nicolson and Nora Mohler,“The Scientific Background of Swift’s *Voyage to Laputa,*”in Nicolson,

Science and Imagination, p. 328.

5. [illegible]Ripley’s Believe It or Not[illegible]·[illegible]（Robert Ripley[illegible]
6. Lisa Jardine, *Ingenious Pursuits*, p. 114.
7. Lisa Jardine, *The Curious Life of Robert Hooke*, p. 105. [illegible]“[illegible]”[illegible]
8. Weld, *History of the Royal Society*, vol. 1, p. 220.
9. I owe this insight to Steven Shapin,“The House of Experiment in Seventeenth-Century England,”p. 376.
10. Boorstin, *The Discoverers*, p. 409, quoting Thomas Sprat, *History of the Royal Society*,(London: 1734),p. 322.
11. [illegible]Alfonso X de Castilla[illegible]el Sabio[illegible]1221[illegible]1284[illegible]（Castile, León and Galicia[illegible]“[illegible]”[illegible]
12. Cohen, *Revolution in Science*, p. 87.
13. [illegible]·[illegible]1914[illegible]2004[illegible]——[illegible]
14. Boorstin, *The Discoverers*, p. 409.
15. John Barrow, *Pi in the Sky* (New York: Oxford University Press, 1992),p. 205.
16. [illegible]·[illegible]
17. [illegible]·[illegible]
18. Daston and Park, *Wonders and the Order of Nature*, p. 61.
19. Ibid.,p. 39.
20. William Eamon, *Science and the Secrets of Nature*, p. 60.
21. Ecclesiastes 3:22–23, quoted in Eamon, *Science and the Secrets of Nature*, p. 60.
22. [illegible]46[illegible]

23. Westfall, *Science and Religion in Seventeenth-Century England*, p. 22.
24. Shapin, *The Scientific Revolution*, p. 82.
25. Allan Chapman, *England’s Leonardo: Robert Hooke and the Seventeenth-Century Scientific Revolution*, p. 40.
26. [illegible]“[illegible]Highgate hill[illegible]”[illegible]·[illegible]John Aubrey[illegible]“[illegible]”John Aubrey, *Brief Gives* (Woodbridge, Suffolk: Boydell, 1982),entry for “Francis Bacon”.
27. Ibid.,p. 40.
28. Jardine, *Ingenious Pursuits*, p. 56.

[illegible]

[illegible]·[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]17[illegible]·[illegible]（Girolamo Cardano）[illegible]“[illegible]”[illegible]“[illegible][注]”[引]

[illegible]——[illegible]·[illegible]“[illegible]”[illegible][引][illegible]

[illegible]“[illegible]”[illegible]·[illegible]（Fritz Houtermans）[注][illegible]1929[illegible]“[illegible]”[引]

[illegible]——[illegible]

[illegible][引][illegible][注][illegible]

[illegible]“[illegible]”[illegible]“[illegible]……[illegible]”引

[illegible]“[illegible]”[illegible]“[illegible]”引[illegible]——[illegible]

[illegible]注

[illegible]

[illegible]“[illegible]……[illegible]”引

[illegible]——[illegible]“[illegible]”注——[illegible]注[illegible]“[illegible]”[illegible]“[illegible]”[illegible]引

[illegible]“[illegible]”[illegible]17[illegible]“[illegible]”[illegible]“……[illegible]”[illegible]引

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]·[illegible]“[illegible]”引

[illegible]

[illegible]17[illegible]

1. [illegible]“[illegible]”[illegible]（Hippasus）[illegible]2[illegible]2[illegible]14[illegible]10[illegible]
2. David Berlinski, *Infinite Ascent*, p. 66.
3. Eamon, *Science and the Secrets of Nature*, p. 330.
4. [illegible]·[illegible]（1903—1966）[illegible]
5. Simon Singh, *Big Bang* (New York: Harper, 2004),p. 302. Richard Feynman tells the story in its classic, romantic form in his *Feynman Lectures on Physics* (Reading, MA: Addison-Wesley, 1963),pp. 3–7, almost as soon as he begins.
6. Eamon, *Science and the Secrets of Nature*, p. 347.
7. [illegible]·[illegible]（Hernando Cortes, 1485 1547）[illegible]
8. Ibid.,p. 347.
9. Paolo Rossi, *The Birth of Modern Science*, p. 18.
10. [illegible]“[illegible]”[illegible]·[illegible]（Paolo Rossi）[illegible]“[illegible]”（liberal arts）[illegible]（liberi）[illegible]Rossi, *The Birth of Modern Science*, p. 15.
11. Eamon, *Science and the Secrets of Nature*, p. 348.
12. [illegible]·[illegible]·[illegible]（Leonardo di ser Piero da Vinci, 1452—1519）[illegible]

[illegible]“[illegible]
[illegible]”[illegible]

13. [illegible]13[illegible]·[illegible]Peter Lely[illegible]·[illegible]“[illegible]”[illegible]
14. Ibid.,p. 25, quoting Sprat, *History of the Royal Society*, pp. 62–63.
15. Sprat, *History of the Royal Society*, p. 113.
16. Carey, *John Donne*, p. 58.

[illegible]

[illegible]·[illegible]Thomas Hobbes[illegible][注][illegible]1655[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]

[illegible]·[illegible]“[illegible]”[illegible]——[illegible]“[illegible]”[illegible]“[illegible]”[illegible][注]

[illegible]·[illegible]Samuel Johnson[illegible][注][illegible]“[illegible][注][illegible]”[引][illegible]“[illegible]”[illegible]“[illegible]”[illegible][引][illegible]

[illegible]

[illegible]——[illegible][注][illegible]1672[illegible]“[illegible]”[illegible]

[illegible]I. [illegible]·[illegible]I. Bernard Cohen[illegible]注[illegible]“[illegible]”[illegible]引

[illegible]

[illegible]“[illegible]”[illegible]

[illegible]·[illegible]Ben Jonson[illegible]注[illegible]10[illegible]

[illegible]·[illegible]·[illegible]John Flamsteed[illegible]注[illegible]·[illegible]Christiaan Huygens[illegible]注[illegible]“[illegible]”“[illegible]”[illegible]“[illegible]”[illegible]引[illegible]

“[illegible]”[illegible]“[illegible]”[illegible]引

“Nullius in Verba”[illegible]·[illegible]Gore Vidal[illegible]注[illegible]“[illegible]”

1. [illegible]·[illegible]1588[illegible]1679[illegible]1651[illegible]
2. Rossi, *The Birth of Modern Science*, p. 24.

3. [illegible]·[illegible]Subrahmanyan Chandrasekhar[illegible]"Shakespeare, Newton, and Beethoven, or Patterns of Creativity,"http://www.sawf.org/newedit/edit02192001/musicarts.asp[illegible]
4. [illegible]·[illegible]1709[illegible]1784[illegible]Dr. Johnson[illegible]
5. [illegible]18[illegible]Laplace[illegible]"[illegible]"[illegible]"[illegible]"[illegible]·[illegible]Nathaniel Bowditch[illegible]Dirk Struik, *A Concise History of Mathematics*, p. 135[illegible]Laplace transform[illegible]*t* (*t* ≥ 0)[illegible]*s*[illegible]
6. James Boswell, *Life of Johnson* (London: Henry Frowde, 1904),vol. 2, p. 566.
7. Westfall, *Never at Rest*, p. 459.
8. [illegible]*The Philosophical Transactions of the Royal Society*[illegible]*Phil. Trans.*[illegible]1665[illegible]Philosophical[illegible]natural philosophy[illegible]
9. [illegible]I. [illegible]·[illegible]1914[illegible]2003[illegible]
10. Merton, *On the Shoulders of Giants*, p. 11, quoting I. Bernard Cohen, *Franklin and Newton.*
11. [illegible]·[illegible]1572[illegible]1637[illegible]
12. [illegible]·[illegible]1646[illegible]1719[illegible]1675[illegible]1719[illegible]·[illegible] 1666[illegible]1668[illegible]
13. [illegible]·[illegible]1629[illegible]1695[illegible]
14. Steven Shapin,"Rough Trade,"*London Review of Books*, March 6, 2003, reviewing *The Man Who Knew Too Much: The Strange and Inventive Life of Robert Hooke*, by Stephen Inwood.

15. Manuel, *A Portrait of Isaac Newton*, p. 145, and Mordechai Feingold, *The Newtonian Moment*, pp. 23–24.
16. [illegible]·[illegible]1925[illegible]2012[illegible]

[illegible]

[illegible][引][illegible]“[illegible]”[illegible][引]

[illegible]17[illegible]

[illegible]——[illegible]——[illegible]thief[illegible]T[illegible]T[illegible]

[illegible]1656[illegible][注][illegible]·[illegible]James Nayler[illegible][注][illegible]“[illegible]”[illegible]300[illegible]B[illegible][注][illegible]3[illegible][引]

[illegible]17[illegible]“[illegible]”[illegible][注][illegible]“[illegible]”[illegible]·[illegible]Liza Picard[illegible][注][illegible]“[illegible]”[引][illegible][引][illegible]

[illegible]30[illegible][注]

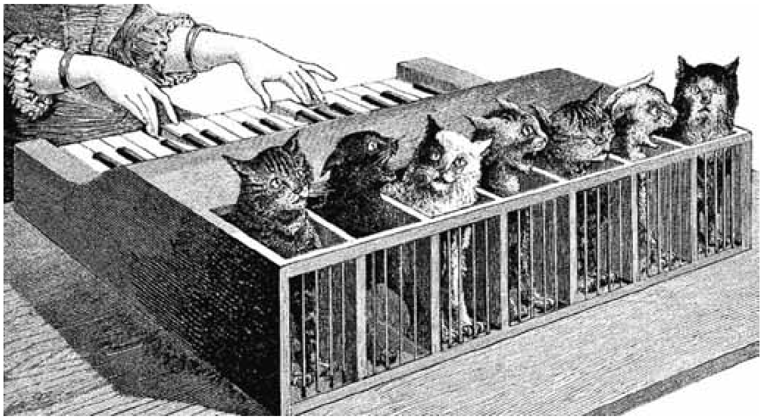
1616[illegible]

[illegible]1663[illegible]5[illegible]11[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]1663[illegible]“[illegible]”[illegible]“[illegible]……[illegible]”[引]

[illegible]17[illegible]——[illegible]“[illegible]”——[illegible][引][illegible]

[illegible]·[illegible]Athanasius Kircher[illegible][注][illegible]“[illegible]”[引]



[illegible]“[illegible]”[illegible]·[illegible]Keith Thomas[illegible]“[illegible]”[引]

[illegible][引][illegible]“[illegible]”[illegible][引][illegible]

[illegible]14[illegible]Galen[illegible][注][illegible]“[illegible]”[illegible]——[illegible]——[illegible][注][illegible]——[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]“[illegible]”[illegible]“[illegible]”[引][illegible][引][illegible]

[illegible]1666[illegible]11[illegible]·[illegible]William Croone[illegible][注][illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”

1. Terence Hawkes, *London Review of Books*, December 11, 1997, reviewing *Issues of Death: Mortality and*

Identity in English Renaissance Tragedy, by Michael Neill.

2. Ibid.
3. [illegible]Quaker[illegible]17[illegible]·[illegible]George Fox[illegible]“[illegible]quaker[illegible]”[illegible]“[illegible]”[illegible]Quaker[illegible]Philadelphia[illegible]Quaker City[illegible]Quaker[illegible]
4. [illegible]·[illegible]1616[illegible]1660[illegible]1656[illegible]
5. [illegible]“[illegible]”[illegible]horrid blasphemy,[illegible]B[illegible]
6. Beer, *Milton*, p. 301.
7. Picard, *Restoration London*.[illegible]1660[illegible]10[illegible]13[illegible]“[illegible]”[illegible]“[illegible]”[illegible]
8. [illegible]·[illegible]
9. Picard, *Restoration London*, p. 211.
10. Beer, *Milton*, p. 302.
11. [illegible]“[illegible]·[illegible]Thomas More[illegible]”[illegible]·[illegible]“[illegible]‘[illegible]’[illegible]”[illegible]·[illegible]1478[illegible]1535[illegible]1516[illegible]1535[illegible]·[illegible]1626[illegible]1697[illegible]
12. The account of London Bridge (and the reference to Thomas More) comes from Picard, *Restoration London*, p. 23. See also Aubrey, *Brief Lives*, “Sir Thomas More,” and Paul Hentzner, *Travels in England During the Reign of Queen Elizabeth*, available at http://ebooks.adelaide.edu.au/h/hentzner/paul/travels/chapter1.html.

13. Pepys's diary entry for February 17, 1663.
14. Steven Shapin, "Vegetable Love," *New Yorker*, January 22, 2007, reviewing *The Bloodless Revolution*: *A Cultural History of Vegetarianism from 1600 to Modern Times*, by Tristram Stuart.
15. □□□□□□□·□□□1602□1680□□"□□□"□□□□□□□□□□□□□□□□□□□□□□□□□□□□
16. Thomas Hankins and Robert Silverman, *Instruments and the Imagination* (Princeton, NJ: Princeton University Press, 1999), pp. 73, 247.
17. Keith Thomas, *Man and the Natural World*, p. 147.
18. Tinniswood, *His Invention So Fertile*, p. 1.
19. Ibid.,p. 34.
20. □□□□□□129□200□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□
21. □□□□□□disease□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ease□□□□□dis-ease□□
22. Robert Boyle,"Trial proposed to be made for the Improvement of the Experiment of Transfusing Blood out of one Live Animal into Another,"*Philosophical Transactions*, February 11, 1666, available at http://rstl.royalsocietypublishing.org/content/1/1-22/385.
23. The ambassador intended to test the effects of a substance called Crocus metallorum, sometimes used as a medicine to induce vomiting.
24. Tinniswood, *His Invention So Fertile*, p. 37.
25. □□□□□□·□□□□1633□1684□□□□□□□□□□□□□□□□□□□□
26. Pepys's diary, November 14 and 16, 1666.

[illegible]

[illegible]——[illegible][引][illegible][引][illegible]*Hydrostatical Paradoxes*[illegible][引][illegible]“[illegible]”[引][illegible]17[illegible]80[illegible]——[illegible][注][illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible][引]

[illegible]——[illegible]——[illegible]“[illegible]”[illegible][引][illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[引]

[illegible]·[illegible]Joseph Glanvill[illegible][注][illegible]“[illegible]”[illegible]“[illegible]”[引][illegible]“[illegible]”[illegible][注]

[illegible]1676[illegible]17[illegible]“[illegible]”[illegible]Saturday Night Live[illegible][注][illegible]*The Virtuoso*[illegible]·[illegible]Thomas Shadwell[illegible]

[illegible]·[illegible]Sir Nicholas Gimcrack[illegible][注][illegible]

[illegible]“[illegible]……[illegible]”

[illegible]“[illegible]2000[illegible]”[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”

[illegible]·[illegible]Samuel Butler[illegible]“[illegible]”[illegible]

[illegible]·[illegible]Jonathan Swift[illegible]*Gulliver’s Travels*[illegible]1710[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]8[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”

[illegible]

[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]——[illegible]——[illegible]

[illegible]1931[illegible]“[illegible]”[illegible]“[illegible]”

[illegible]17[illegible]“[illegible]”

[illegible]“[illegible]”[illegible]“[illegible]”

[illegible]

1. Claire Tomalin, *Samuel Pepys*, p. 248.
2. Pepys’s diary, August 13, 1664.
3. Pepys’s diary, June 4, 1667.
4. Pepys’s diary, June 10, 1667.
5. [illegible]·[illegible]James Thurber[illegible]“[illegible]”[illegible]1664[illegible]8[illegible]“[illegible]”[illegible]*My Life and Hard Times*[illegible]·[illegible]1894[illegible]1961[illegible]*New Yorker*[illegible]*University Days*[illegible]

6. Michael Hunter, *Science and Society in Restoration England*, p. 131. See also Pepys's diary, February 1, 1664.
7. Hunter, *Science and Society in Restoration England*, pp. 91–92.
8. Hunter, *Science and Society in Restoration England*, pp. 91–92.
9. [illegible]·[illegible]1636[illegible]1680[illegible]
10. Manuel, *A Portrait of Isaac Newton*, p. 130, quoting Joseph Glanvill. Glanvill's remark is from his *Vanity of Dogmatizing*, written in 1661.
11. [illegible]17[illegible]No witches, no God![illegible]
12. [illegible]NBC[illegible]90[illegible]1975[illegible]30[illegible]
13. [illegible]·[illegible]Gimcrack[illegible]
14. [illegible]"[illegible]""[illegible]"[illegible]
15. Claude Lloyd,"Shadwell and the Virtuosi."The Shadwell quotes come from Lloyd's essay.
16. Shapin,"Rough Trade."
17. [illegible]Tenerife[illegible]
18. [illegible]the Isle of Dogs[illegible]
19. [illegible]·[illegible]1613[illegible]1680[illegible]
20. In his poem *Hudibras*, part 2, canto 3.
21. [illegible]·[illegible]1667[illegible]1745[illegible]·[illegible]Lemuel Gulliver[illegible]
22. Nicolson and Mohler,"The Scientific Background of Swift's *Voyage to Laputa*,"p. 320.
23. Jonathan Swift, *Gulliver's Travels*, part 3, ch. 5.
24. [illegible]1800[illegible]

25. Ibid.,part 3, ch. 4.
26. Ibid.,part 3, ch. 2.
27. Marcia Bartusiak,“Einstein and Beyond,”*National Geographic*, May 2005, available at <http://science.nationalgeo graphic.com/science/space/universe/beyond-einstein.html>.
28. John Redwood, *Reason, Ridicule, and Religion*, p. 119, and Roy Porter, *The Creation of the Modern World*, p. 130.
29. Hunter, *Science and Society in Restoration England*, p. 175.

[illegible]

[illegible]——[illegible]

[illegible]——[illegible]——[illegible]“[illegible]”[illegible]planet[illegible]“[illegible]”[illegible]

[illegible]——[illegible]——[illegible]

[illegible]6[illegible]1[illegible]6[illegible]1[illegible]6[illegible]1[illegible]

[illegible]300[illegible]“[illegible]”[illegible]——[illegible]——[illegible]“[illegible]”[illegible]——[illegible]

[illegible]earth-y[illegible]

[illegible]“[illegible]”[illegible]引[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”注[illegible]“[illegible]”[illegible]

[illegible]

[illegible]“[illegible]”引[illegible]“[illegible]”注

[illegible]“[illegible]”[illegible]——[illegible]Physics[illegible]“[illegible]”[illegible]the actuality of a potentiality[illegible]引[illegible]

[illegible]reality[illegible]——[illegible]——[illegible]——[illegible]——[illegible]“[illegible]”引

[illegible]

[illegible]C. C. [illegible]Charles C. Gillispie[illegible]注[illegible]“[illegible]”[illegible]“[illegible]……[illegible]”引[illegible]“[illegible]”[illegible]force[illegible]“[illegible]‘[illegible]’[illegible]‘[illegible]’”[illegible]

[illegible]——[illegible]——[illegible]

[illegible]“[illegible]/[illegible]”[引][illegible]John Keats[illegible][注][illegible]·[illegible]Walt Whitman[illegible][注][illegible]“[illegible]”[illegible]“[illegible]”[illegible][引]

[illegible]

[illegible]“[illegible]”[illegible]why[illegible]“[illegible]”[illegible]how[illegible]——[illegible]·[illegible]“[illegible]”[引][illegible]

[illegible]“[illegible]‘[illegible]’”[illegible][引][illegible]“[illegible]”[illegible][引][illegible]

1. [illegible]——[illegible]Jurgen Renn ed.,*Galileo in Context* (New York: Cambridge University Press, 2002),p. 198.
2. [illegible]1889[illegible]6[illegible]19[illegible]Saint Remy[illegible]*Starry Night*[illegible] Albert Boime,“Van Gogh’s Starry Night: A History of Matter and a Matter of History,”*Arts Magazine*, December 1984,http://www.albertboime.com/Articles.cfm.[illegible]·[illegible]Donald Olson[illegible]·[illegible]Edvard Munch[illegible]*The Scream*[illegible]

3. Herbert Butterfield, *The Origins of Modern Science*, p. 6.
4. [illegible]dying[illegible]
5. The passage is from Galileo’s *Assayer* (1623), available at http://www.princeton.edu/~hos/h291/assayer.htm.
6. [illegible]“[illegible]……”[illegible]·[illegible]“[illegible]”Richard Feynman, *The Character of Physical Law*, p. 58.[illegible]·[illegible]Richard Phillips Feynman, 1918[illegible]1988[illegible]1965[illegible]20[illegible]
7. Quoted in Joe Sachs,“Aristotle: Motion and Its Place in Nature,”at http://www.iep.utm.edu/aris-mot/. The remark is quoted in slightly different form in Oded Balaban,“The Modern Misunderstanding of Aristotle’s Theory of Motion,”at http://tinyurl.com/y24yvwo.
8. Galileo, *The Assayer*.
9. [illegible]C. C. [illegible]*Dictionary of Scientific Biography*[illegible]
10. Charles Coulston Gillispie, *The Edge of Objectivity*, p. 43.
11. John Keats, *Lamia*, part 2.
12. [illegible]·[illegible]1795[illegible]1821[illegible]
13. [illegible]·[illegible]1819[illegible]1892[illegible]
14. Walt Whitman,“When I Heard the Learn’d Astronomer.”
15. The remark is nearly always attributed to Feynman, it seems to have been coined by the physicist David Mermin. See David Mermin,“Could Feynman Have Said This?,”*Physics Today*, May 2004, p.10, available at http://tinyurl.com/yz5qxhp.
16. Steven Nadler,“Doctrines of explanation in late scholasticism and in the mechanical philosophy,”in Daniel Garber and Michael Ayers, eds.,*The Cambridge*

History of Seventeenth-Century Philosophy (New York: Cambridge University Press, 1998).

17. Kline, *Mathematics: The Loss of Certainty*, p. 47, quoting Galileo, *Two New Sciences.*

[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”引

[illegible]·[illegible]Nicolaus Copernicus[illegible]

[illegible]注[illegible]17[illegible]30[illegible]

[illegible]·[illegible]17[illegible]17[illegible]注[illegible]

[illegible]1543[illegible]5[illegible]24[illegible]

[illegible]20[illegible]

[illegible]“[illegible]”引

[illegible]

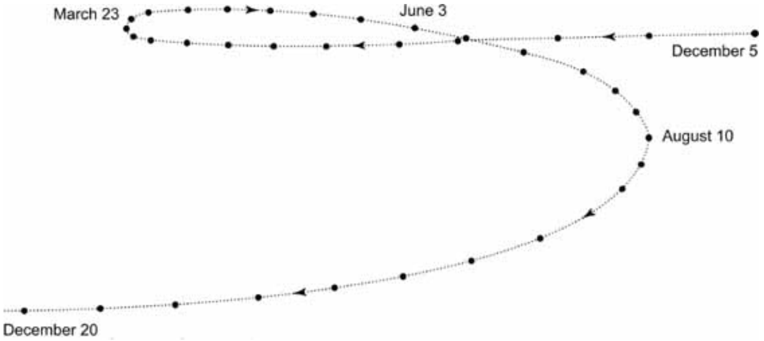
[illegible]

[illegible]“[illegible]”[illegible]·[illegible]Thomas Kuhn[illegible]注[illegible]“[illegible]”引

[illegible]——[illegible]70[illegible]——[illegible]

[illegible]“[illegible]”引[illegible]·[illegible]Henry More[illegible]注[illegible]

[illegible]



[illegible]6[illegible]8[illegible]

[illegible]——[illegible]

[illegible]

[illegible]——[illegible]——[illegible][引]

[illegible]“[illegible]”[illegible]·[illegible]Arthur Koestler[illegible][注][illegible]“[illegible]‘[illegible]’[illegible]‘[illegible]’[illegible]”[引]

[illegible]

[illegible]·[illegible]“[illegible]/[illegible]”[引][illegible]

“[illegible]”[illegible]“[illegible]”

1. Richard Westfall,“Newton and the Scientific Revolution,”in Stayer, ed.,*Newton’s Dream*, p. 10.
2. [illegible]“[illegible]”[illegible]
3. [illegible]“[illegible]17[illegible]”[illegible]·[illegible]Mario Biagioli[illegible]“[illegible]”[illegible]See Roy Porter and Mikulas Teich, eds.,*The Scientific Revolution in National Context* (New York: Cambridge University Press, 1992),p. 12.
4. Thomas Kuhn, *The Copernican Revolution*, p. 190, quoting Jean Bodin.
5. [illegible]·[illegible]1922[illegible]1996[illegible]
6. Ibid., p. 193.
7. Kline, *Mathematics in Western Culture*, p. 117.
8. [illegible]·[illegible]1614[illegible]1687[illegible]

9. Richard Westfall, "Newton and the Scientific Revolution," pp. 6–7.
10. [illegible]·[illegible]1905[illegible]1983[illegible]*Darkness at Noon*[illegible]
11. Arthur Koestler, *The Sleepwalkers*, p. 498.
12. John Donne, "An Anatomy of the World."

□□

□□□□·□□□□Virginia Woolf□[注]□□□□□□□□□□“□□□□1910□□12□□□□□□□□□□”[引]□□□□□□□□□□□□□□□□□□□□□□□□□□□□□1610□1□7□□□□□□□□□□□□□□□□□——□□□□□□□□□□□□□□□□□□——□□□□□□

3□□□□□□□□□□□□□□□□□□□*The Starry Messenger*□□□□□□□□□□□□□□□□□□□□□□□□□□□□·□□□□□□□□□□□□“□□□”□□□□“□□”□□□□□□□□□□□□□□□□□□□□□□□□□□□“□□”□□□□□□□“□□”——□□□□□□□□□□□□□

□□□□□□□□□□“□□□□Padua□□□□□……□□□4□□□□□□□□□”[引]——□□□□□□□□4□□□□——□□“□……□□□□□□□□□□□□”

□□□□□□□□□□□□□·□□□□Tycho Brahe□[注]□□□□□□□1572□□□□□□□□Cassiopeia□□□□□□□□□□□□[注]□□□“□□□□□□□”[引]□□□□□□□□□□□□□□□□□□□□□W□□□

□□□□□□□□□□□□□□□□□□□□“□□”□□“□□”□[引]

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□“□□□□□”□□□□□□□□□□□□□1604□□□[引]□□

1609[illegible]9[illegible]3[illegible] [引] [illegible]“[illegible]”[illegible]“[illegible]”[illegible]·[illegible]Henry Hudson[illegible] [注] [illegible]“[illegible]”[illegible]Half Moon[illegible]

[illegible]

[illegible]1609[illegible]5[illegible]lentil-shaped[illegible]lens[illegible] [引] [illegible]

[illegible]8[illegible]——[illegible]“[illegible]” [引] [illegible]

“[illegible]”[illegible]“[illegible]spy-glass[illegible]” [引] [illegible]“[illegible]” [引]

[illegible]

[illegible]1611[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

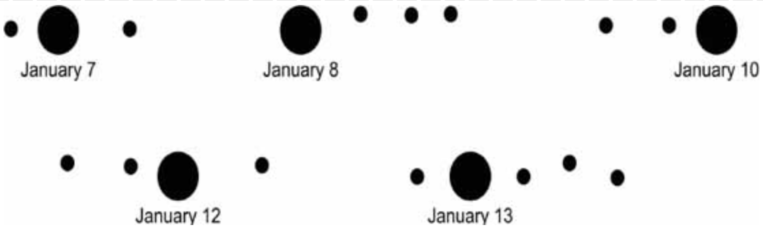
[illegible] [注] [illegible]

[illegible]20[illegible]1572[illegible]1604[illegible]

[illegible]San Marco’s belltower[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]……[illegible]”[illegible]

[illegible]“[illegible]”[illegible]



[illegible]

[illegible]“[illegible]”[illegible]·[illegible]

[illegible]17[illegible]“[illegible]”[illegible]·[illegible]

[illegible]“[illegible]”[illegible]·[illegible]·[illegible]*On the Plurality of Worlds*[illegible]“[illegible]”

[illegible]“[illegible]”[illegible][引][illegible]“[illegible]”[illegible]

[illegible]

[illegible]

[illegible]“[illegible]”[illegible]Michel de Montaigne[illegible][注][illegible]“[illegible]”[illegible][注]

[illegible]“[illegible]”[illegible]Cardinal Bellarmine[illegible]“[illegible][注][illegible]”[引]

[illegible]“[illegible]”[illegible]

[illegible]——[illegible]

[illegible]

1. [illegible]·[illegible]1882[illegible]1941[illegible] 20[illegible]Bloomsbury Group[illegible]Mrs. Dalloway[illegible]*To the Lighthouse*[illegible]

[illegible]*Jakob’s Room*[illegible]20[illegible]

2. Virginia Woolf,“Character in Fiction.”Woolf had in mind how writers like James Joyce portrayed their characters’ inner lives.
3. Nicolson,“The ‘New Astronomy’ and English Imagination,”p. 35.
4. [illegible]·[illegible]1546[illegible]1601[illegible]·[illegible]
5. [illegible]supernova[illegible]1573[illegible]*De Stella Nova*[illegible]“nova”[illegible]“[illegible]”[illegible]
6. Kitty Ferguson, *Tycho and Kepler*, p. 46.
7. Ibid.,p. 47.
8. Nicolson,“The Telescope and Imagination,”p. 8.
9. New-York Historical Society Collections, 2nd ser. (1841), vol. 1, pp. 71–74. This is from an excerpt online at http://historymatters.gmu.edu/d/5829.
10. [illegible]·[illegible]1565[illegible]1611[illegible]
11. *The breakthrough that made the telescope*: Albert Van Helden, ed.,in his “Introduction” to *Sidereal Nuncius* (The Sidereal Messenger),by Galileo Galilei (Chicago: University of Chicago Press, 1989), pp. 2–3.
12. Ibid.,p. 6.
13. Nicolson,“The Telescope and Imagination,”p. 12.
14. Van Helden,“Introduction,”p. 7.
15. Shapin, *The Scientific Revolution*, p. 72.[illegible]
16. Van Helden,“Introduction,”p. 9.
17. [illegible]
18. [illegible]Nicolson,“The Telescope and Imagination,”pp. 14–15.
19. Kuhn, *The Copernican Revolution*, p. 222.
20. Lovejoy, *The Great Chain of Being*, p. 126.

21. Ibid.,p. 133.

22. [illegible]1686[illegible]1543[illegible]1687[illegible]1688[illegible]*A Discovery of New Worlds*[illegible]

23. [illegible]·[illegible]100[illegible]“[illegible]”[illegible]·[illegible]·[illegible]Carl Edward Sagan, 1934[illegible]1996[illegible]

24. Ibid.,p. 127.

25. [illegible]1533[illegible]1592[illegible]

26. Ibid.,p. 102. E. M. W. Tillyard, in *The Elizabethan World Picture*[illegible]“[illegible]”[illegible]p. 39[illegible]

27. [illegible]

28. Karen Armstrong, *A History of God*, p. 290.

[illegible]

[illegible]·[illegible]·[illegible]Antonie van Leeuwenhoek[illegible][注][illegible]

[illegible]——[illegible]——[illegible]“[illegible]”[illegible]“[illegible]animalcules[illegible]”[illegible][注]

[illegible]1677[illegible]11[illegible]15[illegible]“[illegible]”[引][illegible][引][illegible]“[illegible]·[illegible]·[illegible]·[illegible]”[illegible]·[illegible]Stephen Hawking[illegible][注][illegible]UFO[illegible]

[illegible][注][illegible]——[illegible]——[illegible]“[illegible]”[illegible][注]“[illegible]”[illegible]“[illegible]……[illegible]”[注][illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[引]

[illegible]

[illegible]17[illegible]——“[illegible]”[引]——[illegible]10[illegible]

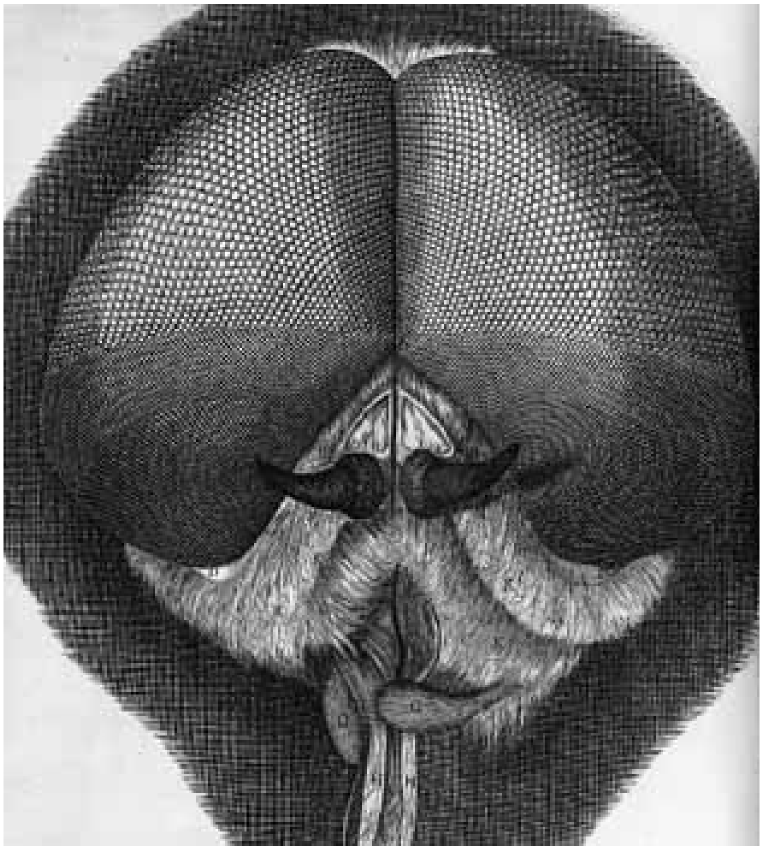
[illegible]“[illegible]”[illegible]“[illegible]——[illegible]”[引][illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[引][illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]1669[illegible]4[illegible]“[illegible]”[illegible][引][illegible]“[illegible]”[引]

[illegible]*Micrographia*[illegible]12[illegible]18[illegible]“[illegible]……”[illegible]14000[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[引]



[illegible]·[illegible]“[illegible]”[illegible]

[illegible]

1. [illegible]·[illegible]·[illegible]1632[illegible]1723[illegible]animalcules[illegible]
2. 1683[illegible]9[illegible]17[illegible]“[illegible]”[illegible] http://ucmp.berkely.edu/history/leeuwen hoek.htm.
3. Marjorie Nicolson “The Microscope and English Imagination,”p. 167.
4. Ibid.,p. 167.
5. [illegible]·[illegible]300[illegible] 1979[illegible]Lucasian Professor[illegible]Lucasian Chair of Mathematics[illegible]1663[illegible]

6. [illegible]Johannes Vermeer, 1632[illegible]1675[illegible]17[illegible][illegible]Vermeer of Delft[illegible]
7. *The Collected Letters of Antoni van Leeuwenhoek*, edited by a Committee of Dutch Scientists (Amsterdam: Swets & Zeitlinger, 1941), vol. 2, pp. 283–95.[illegible]1677[illegible]11[illegible]·[illegible]
8. [illegible]2009[illegible]4[illegible]48[illegible]
9. Clara Pinto-Correia, *The Ovary of Eve* (Chicago: University of Chicago Press, 1997),p. 69.
10. Nicolson,“The Microscope and English Imagination,”p. 210.
11. Michael White, *Isaac Newton: The Last Sorcerer*, p. 149, quoting a notebook entry of Newton’s headed “Of God.”
12. Robert Hooke, *Micrographia.* See http://www.roberthooke.org.uk/rest5a.htm.
13. “Commentary on Galileo Galilei,” in James Newman, ed.,*The World of Mathematics*, vol. 2, p. 732fn.
14. Lisa Jardine, *The Curious Life of Robert Hooke*, p. 164.
15. Westfall, *Science and Religion in Seventeenth-Century England*, p. 27.
16. Shapin, *The Scientific Revolution*, p. 145.

[illegible]

[illegible]17[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]注

[illegible]17[illegible]“[illegible]”[illegible]great chain of being[illegible]——[illegible]——[illegible]引[illegible]

[illegible]17[illegible]QED[illegible]注[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”引

[illegible]“[illegible]”[illegible]——[illegible]

[illegible]注[illegible]“[illegible]”[illegible]——[illegible]——[illegible]

[illegible]·[illegible][引][illegible]“[illegible]”[illegible]Whatever is, is right.[illegible]

[illegible]“[illegible]”[illegible]17[illegible]10%[illegible]“[illegible]”[illegible]“……[illegible]”[引]

[illegible]“[illegible]”[illegible][引]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible][引]

[illegible]“[illegible][注][illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]17[illegible]

17[illegible]——[illegible]

[illegible]“[illegible]”[引]

[illegible]“[illegible]”[illegible]“[illegible]”[引][illegible]“[illegible]”[引][illegible]“[illegible]”[引][illegible]

“[illegible]”[illegible]Nature does not make jumps[illegible][引][illegible]“[illegible]”[illegible]God does not play dice with the universe[illegible]“[illegible]”[illegible][注][illegible]“[illegible]”[引]

[illegible]·[illegible]Jacob Bronowski[illegible][注][illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]“[illegible]”[illegible]17[illegible]

1. Nicolson,“The Microscope and English Imagination,”p. 209, quoting Henry Baker, *Employment for the Microscope*.[illegible]1753[illegible]
2. Tillyard, *The Elizabethan World Picture*, p. 26.
3. [illegible]QED[illegible]Quod Erat Demonstrandum[illegible]
4. Ibid.,p. 40.
5. [illegible]17[illegible]
6. John Carey,“Pope’s Fallibility,”in *Original Copy: Selected Reviews and Journalism 1969–1986* (London: Faber & Faber, 1987),p. 109, and Harold Bloom, *Genius* (New York: Warner, 2002),p. 271.
7. Lovejoy, *The Great Chain of Being*, p. 53.
8. Ibid.,p. 133.
9. Ibid.,p. 224.

10. [illegible]·[illegible]·[illegible]Publius Vergilius Maro[illegible]Virgil[illegible]
11. Ibid.,p. 179.
12. Galileo, *The Assayer.*
13. G. A. J. Rogers,“Newton and the Guaranteeing God,”in Force and Popkin, eds.,*Newton and Religion*, p. 232, quoting Newton’s *Principia*.
14. Paolo Rossi, *Logic and the Art of Memory*, p. 193.
15. Peter K. Machamer, *The Cambridge Companion to Galileo* (New York: Cambridge University Press, 1998), p. 193.
16. Robert Nisbet, *History of the Idea of Progress* (New York: Basic Books, 1980),p. 158.
17. [illegible]Charles de Secondat Montesquieu, 1689[illegible]1755[illegible]“[illegible]”[illegible]“[illegible]”[illegible]
18. Montesquieu, *Persian Letters*, no. 59.
19. [illegible]·[illegible]1908[illegible]1974[illegible]BBC[illegible]
20. Jacob Bronowski, *The Ascent of Man*, p. 256.

[illegible]

[illegible]

[illegible]*The Wisdom of God Manifested in the Works of the Creation*[illegible]·[illegible]“[illegible]”[引][illegible]“[illegible]”[illegible]

[illegible]

[illegible][注][illegible]·[illegible]Thomas Huxley[illegible][注][illegible]*Origin of Species*[illegible]“[illegible]”[引][illegible]

“[illegible]”[illegible]17[illegible]“[illegible]”[illegible]“[illegible]——[illegible]”[引]

[illegible]“[illegible]”[引]

[illegible]“[illegible]”[illegible]“[illegible]”[注][illegible]17[illegible]

[illegible]·[illegible]Henry More[illegible]注[illegible]“[illegible]”[illegible]引[illegible]“[illegible]”[illegible]

[illegible]6000[illegible]引[illegible]17[illegible]

[illegible]·[illegible]Louis Agassiz[illegible]注[illegible]“[illegible]”[illegible]引

1. John Ray, *The Wisdom of God Manifested in the Works of the Creation*, available at http://www.jri.org.uk/ray/wisdom/index.htm.
2. [illegible]
3. [illegible]·[illegible]1825[illegible]1895[illegible]*Evolution and Ethics*[illegible]
4. Leonard Huxley, *The Life and Letters of Thomas Henry Huxley* (New York: Appleton, 1916), vol. 1, p. 176.
5. AndréMaurois cites Voltaire’s remark in his introduction to Voltaire’s *Candide*, trans. Lowell Blair (New York: Bantam, 1959), p. 5.
6. Michael White, *Isaac Newton*, p. 149.
7. [illegible]
8. [illegible]·[illegible]1614[illegible]1687[illegible]
9. Thomas, *Man and the Natural World*, p. 20.
10. Steve Jones, *Darwin’s Ghost* (New York: Random House, 2000),p. 194.
11. [illegible]·[illegible]1807[illegible]1873[illegible]19[illegible]
12. David Dobbs, *Reef Madness: Charles Darwin, Alexander Agassiz, and the Meaning of Coral* (New

York: Pantheon, 2005), p. 3.

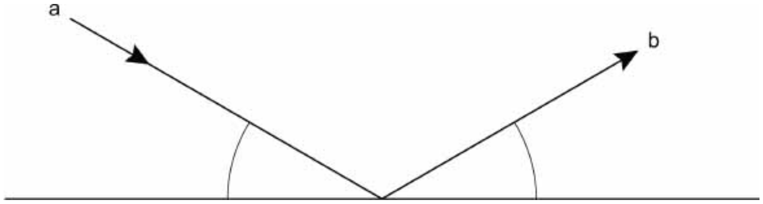
□□

17□□“□□□□”□all things are numbers□[引]□□

□□□□□□□□□□□□□□□□□□□□□□□Pythagoras□□3:2□□□□□□□□□□□□□□□□□□□□□□□□□□□[注]□□□□□□□□□□□□□·□□□□Werner Heisenberg□[注]□□□□□□“□□□□□□□□□□□□□□□□”□[引]

□□□□□□□□□□□□□□□□□□□□□□□□□□□□4□□□□□□□4□□6□□□□□□□□□□6□□□“□□□”□□□[引]□□□□□6□□□□□□□□□□□□□□□□□□□□6=1+2+3□□[注]

□□

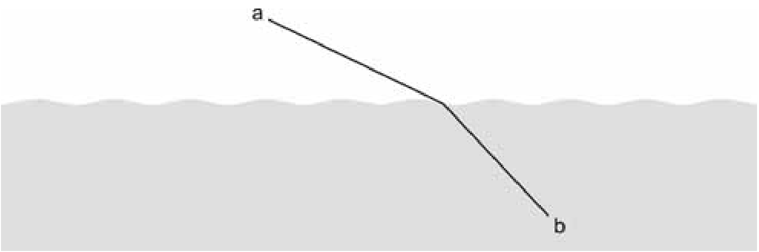


□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□□□□□□□□□□□□□□□□□□□□□□——□□□□□*a*□□□□□□□□□□□□*b*□□

□□□

□□*a*□□□*b*□□



[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]18[illegible]·[illegible]“[illegible]”[illegible][引]

[illegible]17[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]

[illegible][注][illegible]*The Defense*[illegible]·[illegible]Aleksandr Luzhin[illegible]“[illegible]——[illegible]”[illegible]·[illegible]Subrahmanyan Chandrasekhar[illegible][注][illegible]“[illegible]”[illegible][引][illegible]“[illegible]”[引]

[illegible]·[illegible]Bertrand

Russell[illegible][注][illegible]16[illegible]“[illegible]”[illegible][引]

[illegible]“[illegible]”[illegible]–[illegible]·[illegible]Gian-Carlo Rota[illegible][注][illegible]“[illegible]……[illegible]——[illegible]……[illegible]——[illegible]”[引][illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]17[illegible]·[illegible]“[illegible]”[illegible]“[illegible]”[illegible][引]

[illegible]74[illegible]*The Harmony of the World*[illegible]“[illegible]”[illegible]“[illegible]”[引]

1. Kline, *Mathematics: The Loss of Certainty*, p. 12.
2. [illegible]12[illegible]6[illegible]Jamie James, *The Music of the Spheres* (New York: Springer, 1995),p. 35.
3. [illegible]·[illegible]1901[illegible]1976[illegible]“[illegible]”[illegible]S[illegible]1932[illegible]
4. Chandrasekhar,“Shakespeare, Newton, and Beethoven.”
5. Barrow, *Pi in the Sky*, p. 256.
6. [illegible]28[illegible]1+2+ 4+7+14[illegible]496[illegible]28=1+2+4+7+14[illegible]1[illegible]2[illegible]4[illegible]7[illegible]14[illegible]28[illegible]6=1+ 2+3[illegible]
7. Kline, *Mathematics: The Loss of Certainty*, p. 66.

8. Chandrasekhar,“Shakespeare, Newton, and Beethoven.”
9. [illegible]·[illegible]Vladimir Vladimirovich Nabokov, 1899[illegible]1977[illegible]1955[illegible]*Lolita*[illegible]
10. [illegible]·[illegible]1910[illegible]1995[illegible]1983[illegible]
11. Ibid.
12. From a 1933 lecture by Einstein,“About the Origins of General Relativity,”at Glasgow University. Matthew Trainer discusses Einstein’s lecture in“About the Origins of the General Theory of Relativity: Einstein’s Search for the Truth,”*European Journal of Physics* 26, no. 6 (November 2005).
13. [illegible]·[illegible]1872[illegible]1970[illegible] 1950[illegible]20[illegible]·[illegible]
14. *The Autobiography of Bertrand Russell* (Boston: Little, Brown, 1967), p. 38.
15. [illegible]–[illegible]·[illegible]1932[illegible]1999[illegible]
16. Gian-Carlo Rota, *Indiscrete Thoughts*, p. 70.
17. Ferguson, *Tycho and Kepler*, p. 344.[illegible]Max Caspar, *Kepler*[illegible]
18. Benson Bobrick, *The Fated Sky* (New York: Simon & Schuster, 2006), p. 70.

[illegible]

[illegible]“[illegible]”[illegible][注][illegible]——[illegible]——[illegible]“[illegible]”20[illegible]G. H. [illegible]G. H. Hardy[illegible][注][illegible]“[illegible]”[引]

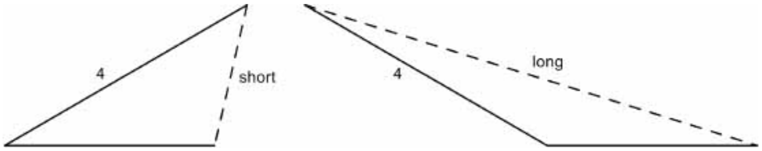
[illegible]——[illegible]——[illegible]17[illegible]“[illegible]”[引][illegible]“[illegible]”[illegible]17[illegible]

[illegible]·[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]“[illegible]”——[illegible]——[illegible]——[illegible]——[illegible][注][illegible]

[illegible]——[illegible]90[illegible]——[illegible]3:4:5[illegible]——3[illegible]4[illegible]5——[illegible]

[illegible]3[illegible]4[illegible]3[illegible]4[illegible]3[illegible]4[illegible]90[illegible]5[illegible]3, 4, 5, 90[illegible]



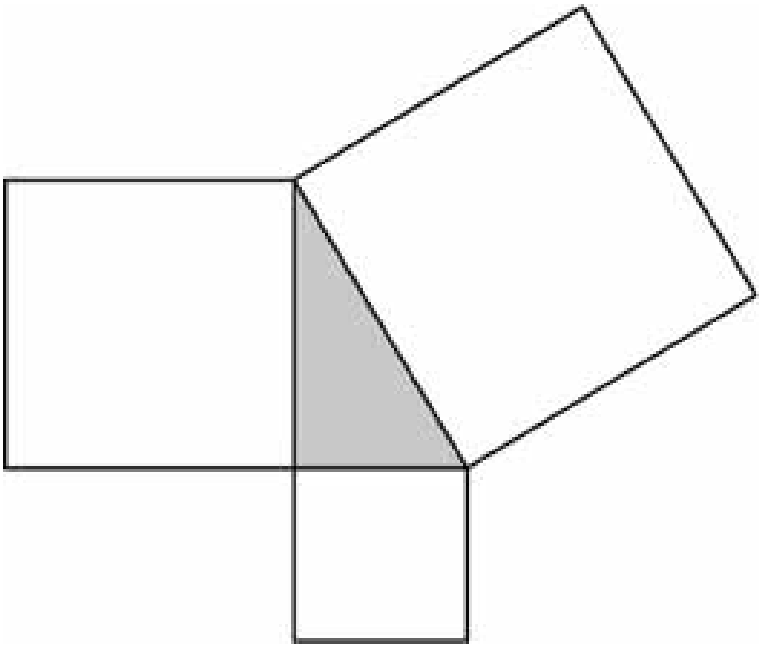
[illegible]——[illegible]1[illegible]——[illegible]1[illegible]3/8[illegible][注][illegible]

[illegible]5[illegible] 12[illegible]13[illegible]

[illegible]3[illegible]4[illegible]5[illegible]5[illegible]12[illegible]13[illegible]

[illegible]——[illegible]$3^2+4^2=5^2$[illegible]$5^2+12^2=13^2$[注][illegible][注]

[illegible]$a^2+b^2=c^2$[illegible]



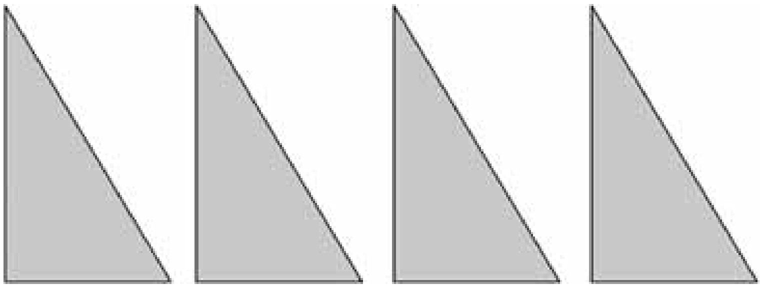
[illegible]

1. [illegible]Paul Lockhart,“A Mathematician’s Lament,”http://tinyurl.com/y89qbh9.
2. [illegible]G. H. [illegible]1877[illegible]1947[illegible]
3. G. H. Hardy, *A Mathematician’s Apology*, p.13, available at http://math.boisestate.edu/~holmes/holmes/A%20Mathematician's%20Apology.pdf.
4. Westfall, *Never at Rest*, p. 192.
5. Bronowski, *The Ascent of Man*, p. 227.
6. [illegible]2[illegible]3[illegible]5[illegible] 7[illegible]10[illegible]10=2×5[illegible]
7. [illegible]1:1:√2[illegible]1[illegible]3/8=1.378, √2[illegible]1.414[illegible]
8. [illegible]$a^2+b^2=c^2$[illegible]*a, b*[illegible]*c*[illegible]2[illegible]——[illegible]*a*[illegible]*b*[illegible]*c*[illegible]$a^3+b^3=c^3$[illegible]$a^4+b^4=c^4$——[illegible] *a*[illegible]*b, c*[illegible]0[illegible]·[illegible]·[illegible]Pierre de Fermat[illegible]1637[illegible]“[illegible]”[illegible]“[illegible]”[illegible]——[illegible]——[illegible]300[illegible]1995[illegible]·[illegible]Amir Aczel[illegible]1591[illegible]1665[illegible]Toulouse[illegible]Diophantus[illegible]“[illegible]”[illegible]25[illegible]16+9[illegible]“[illegible]”[illegible]$x^3+y^3=z^3$[illegible]$x^n+y^n=z^n$[illegible]n[illegible]2[illegible]1995[illegible]·[illegible]Andrew Wiles[illegible]
9. [illegible]

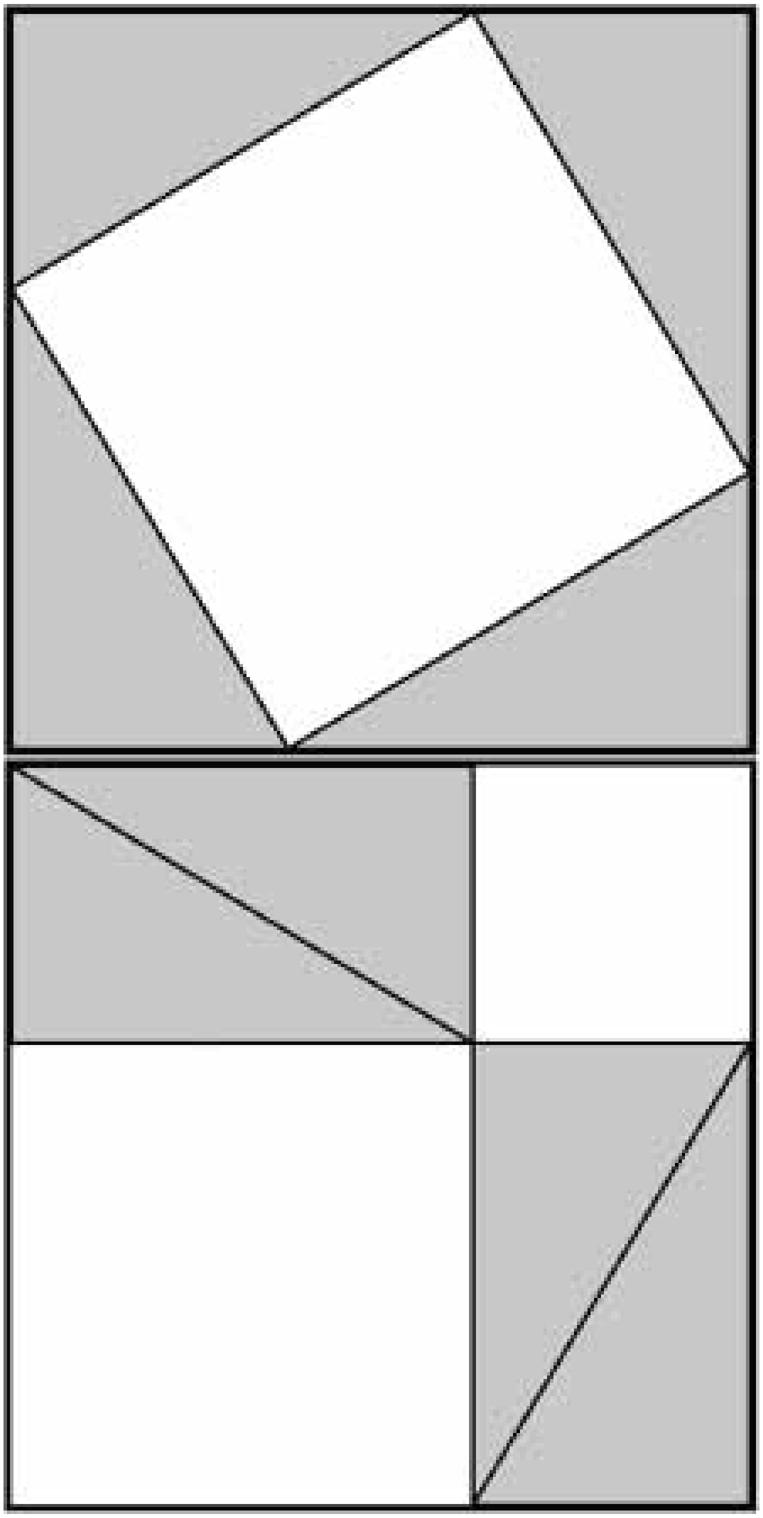
[illegible]

[illegible]“[illegible]”[illegible]——[illegible]——[illegible]

[illegible]——[illegible]



[illegible]X[illegible]Y[illegible]



□□□□□X□□Y□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□
□□X□□Y□□□□□□□
□□□□□□□□□□□□□□□□□□□□□□□□□□□□

[illegible]X[illegible]Y[illegible]

[illegible]“[illegible]”[illegible]

[illegible]——[illegible]——[illegible]——[illegible]——[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]·[illegible]Martin Gardner[illegible]

[illegible]17[illegible]“[illegible]”[illegible]

[illegible]

[illegible]·[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]BEHOLD[illegible]17[illegible]

[illegible]

[illegible]

1. [illegible]·[illegible]1914[illegible]2010[illegible]*Scientific American*[illegible]
2. Mario Livio, *Is God a Mathematician?*, p. 11, quoting Martin Gardner, *Are Universes Thicker than Blackberries*? (New York: Norton, 2004).
3. [illegible]19[illegible]·[illegible]Carl Gauss[illegible]——[illegible]——[illegible]
4. Nicolson,“The Telescope and Imagination,”p. 6, quoting Sir Thomas Browne.
5. [illegible]1930[illegible]“[illegible]”See Albert Einstein,“Religion and Science,”*New York Times Magazine*, November 9, 1930.
6. Eamon, *Science and the Secrets of Nature*, p. 320.

[illegible]

[illegible]·[illegible]

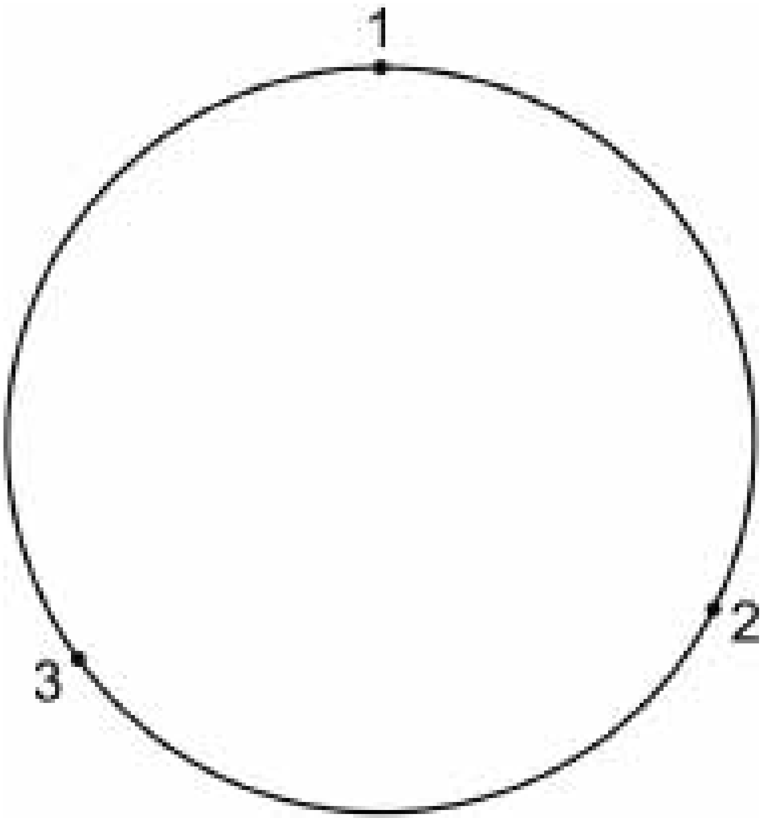
[illegible]“[illegible]”[illegible]“[illegible]”[注]

[illegible]“[illegible]……[illegible]……[illegible]”[引][illegible]“[illegible]”[illegible]“[illegible]……[illegible]”[引]

[illegible]“[illegible]”[illegible]Eureka![illegible][注][illegible]

[illegible]1595[illegible]7[illegible]9[illegible]24[illegible]

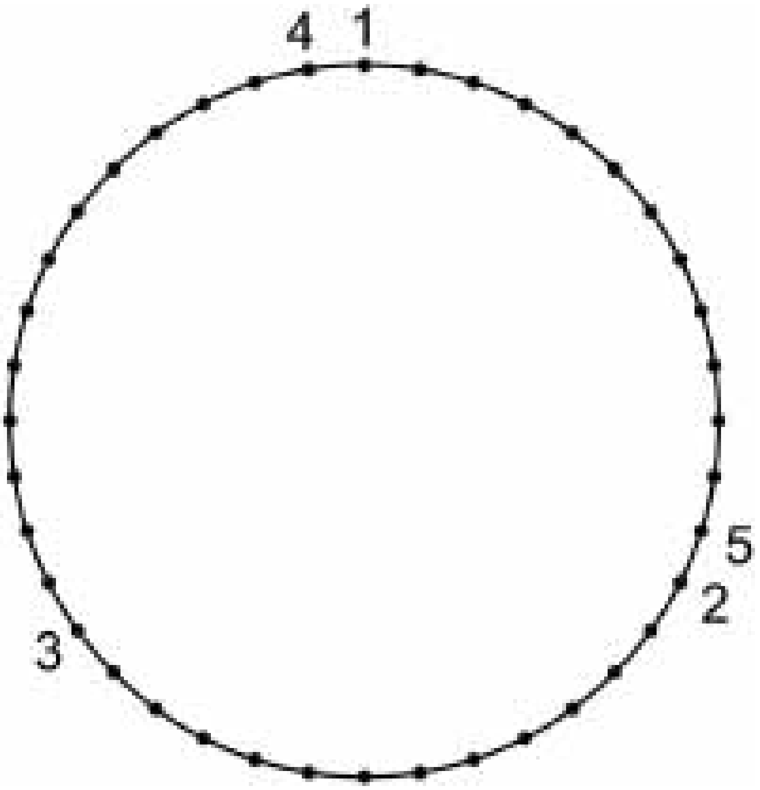
[illegible]——[illegible]jovial[illegible]saturnine[illegible]——[illegible]“[illegible]”[illegible]117[illegible]117[illegible][注][illegible]1[illegible]2[illegible]3[illegible]



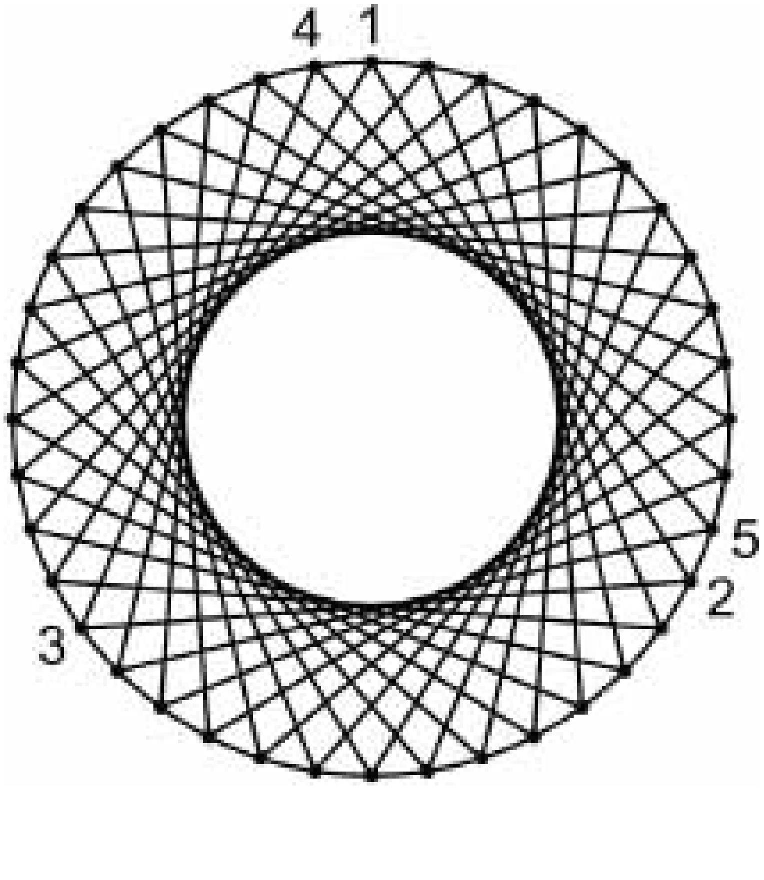
[illegible]1[illegible]2[illegible]3[illegible]

[illegible]117[illegible]120[illegible]

[illegible]1[illegible]5[illegible]



[illegible]1[illegible] 2[illegible]2[illegible]3[illegible]



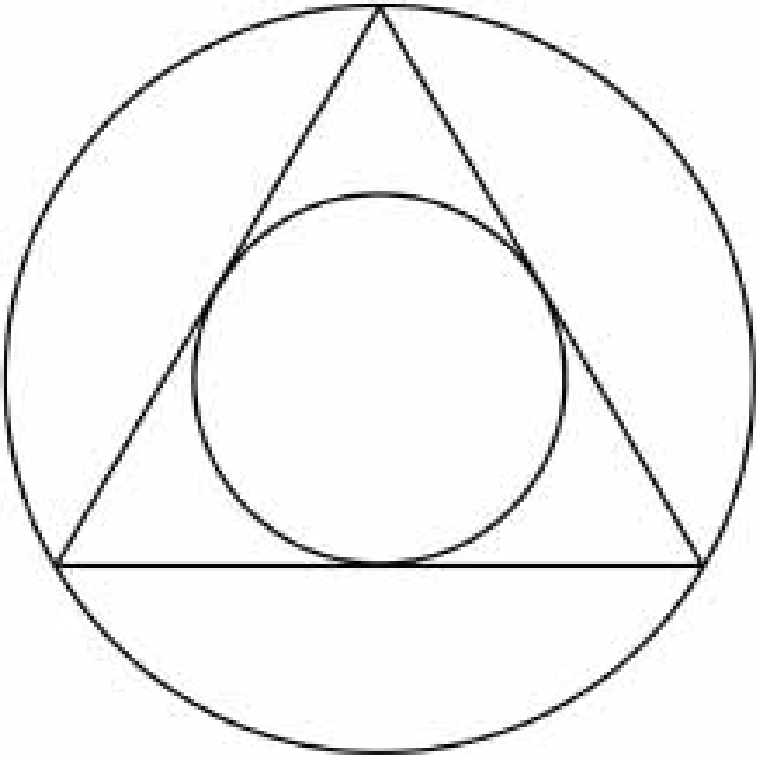
[illegible]·[illegible][注][illegible]“[illegible]”[illegible]“[illegible]”[引]

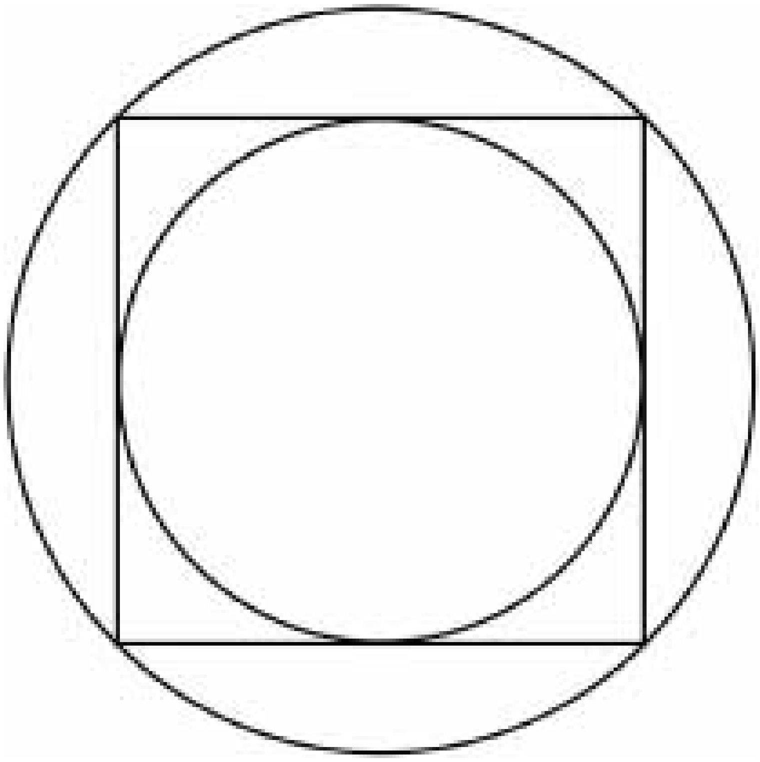
[illegible]

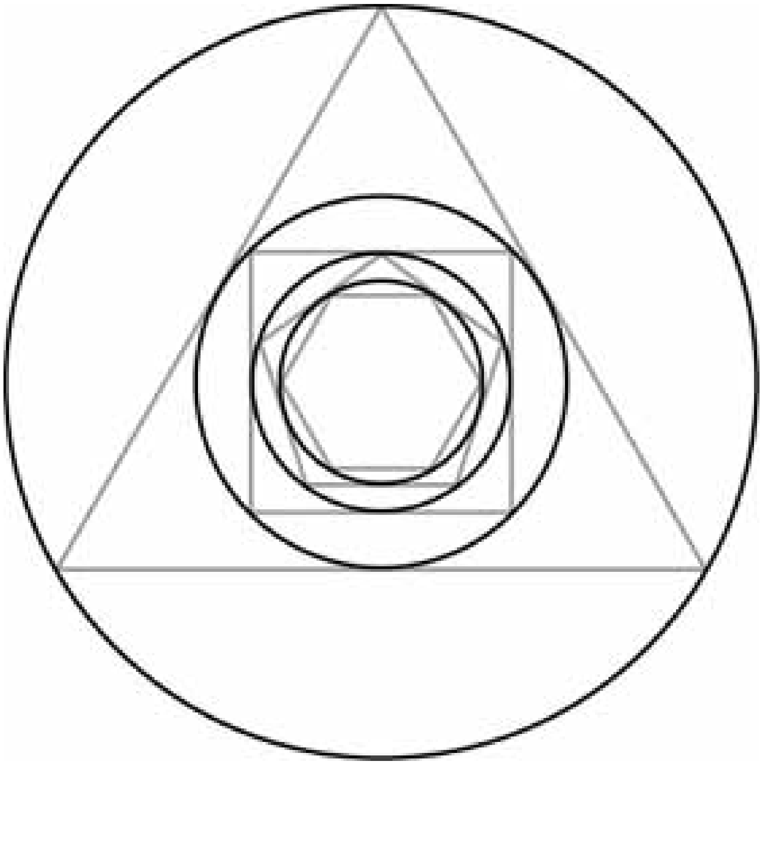
[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible][引][illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]——[illegible]“[illegible]”[illegible]







[illegible]

[illegible]·[illegible]

[illegible]

1. Arthur Koestler, *The Sleepwalkers*, p. 279.[illegible]*The Sleepwalkers*[illegible]
2. Ibid.,p. 231.
3. Ibid.,p. 236.
4. [illegible]Eureka[illegible]“[illegible]”[illegible]“Eureka! Eureka!”[illegible]
5. [illegible]Christopher M. Linton, *From Eudoxus to Einstein*, p. 170.
6. [illegible]·[illegible]*The Da Vinci Code*[illegible]·[illegible]Dan Brown[illegible]2003[illegible]*Angels and Demons*[illegible]
7. Koestler, *The Sleepwalkers*, p. 247.
8. Ibid., p. 249.

[illegible]

[illegible]“[illegible]——[illegible]”[引]

[illegible]——[illegible]6[illegible][注][illegible]6[illegible]“[illegible]20[illegible]100”[illegible][引][illegible]

[illegible]——[illegible]100[illegible]1000[illegible]——[illegible]50[illegible]1000[illegible]

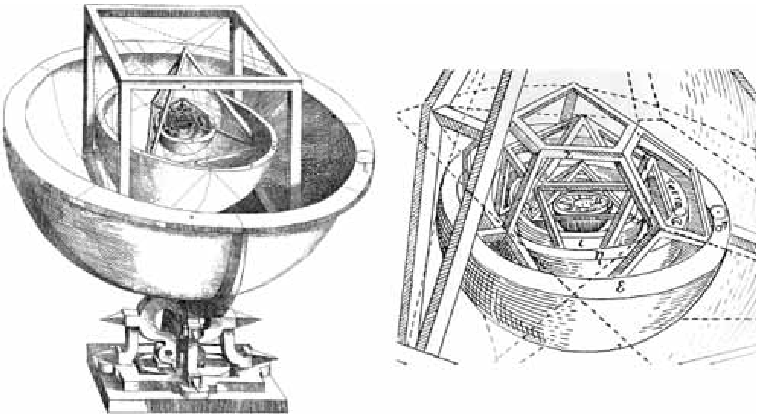
[illegible]“[illegible]”[illegible]Platonic solids[illegible][注][illegible]5[illegible]——[illegible][注][illegible]·[illegible]·[illegible]Marcus du Sautoy[illegible][注][illegible][注][illegible][引][illegible]

[illegible]5[illegible]6[illegible]sphere[illegible]6[illegible][引]

“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible][引]

[illegible]“[illegible]

□□□□□□□”



□□□□□□□□□□□□□□□□□□□□□□□□□□□□5□“□□□□”□□□□□□□□□□□□□□□□□□□□□□□□□□
□□□□

***

□□□□□□□□□□□□□□“□□□□□□□□□□□□□□□”□□□□□□□□□□□“□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□”[引]

1596□□□□□□□□□□□□*The Mystery of the Universe*□□[引]“□□□□□□”□□□□□□□□“□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□”[引]

□□·□□□James Waston□[注]□□□□□DNA□□□□□“□□□□□□□□”□[引]□□□

□□·□□

[illegible]

[illegible]

[illegible]——[illegible]17[illegible]——[illegible]

[illegible]·[illegible]Owen Gingerich[illegible][注][illegible]“[illegible]”[引]

1. Koestler, *The Sleepwalkers*, p. 250.
2. [illegible]2006[illegible]8[illegible]26[illegible]
3. Ibid.,p. 248.
4. [illegible]
5. [illegible]360[illegible]120[illegible]
6. [illegible]·[illegible]·[illegible]
7. [illegible]——[illegible]——[illegible]
8. Marcus du Sautoy, *Symmetry* (New York: Harper, 2008),p. 5.
9. Caspar, *Kepler*, p. 63.
10. Koestler, *The Sleepwalkers*, p. 251.
11. Owen Gingerich,“Johannes Kepler and the New Astronomy,”available at http://adsabs.harvard.edu/full/1972QJRAS..13..346G.
12. Koestler, *The Sleepwalkers*, p. 269.

13. Caspar, *Kepler*, p. 71.
14. [illegible]·[illegible]DNA[illegible]
15. James Watson, *The Double Helix* (New York: Touchstone, 2001),p. 204.
16. [illegible]·[illegible]
17. Gingerich,“Johannes Kepler and the New Astronomy,”p. 350.

[illegible]

[illegible]——[illegible]——[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]“[illegible]”[illegible]“[illegible][引][illegible]”[illegible][注]

[illegible]“[illegible]”[illegible][注]

[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]·[illegible]

[illegible][注][illegible]1572[illegible][注][illegible]——[illegible]

[illegible][引][illegible]

[illegible]6[illegible]

[illegible]14[illegible]5[illegible]“[illegible]”

[illegible]

[illegible]18[illegible]“[illegible]”[illegible]“[illegible]”

1. Rossi, *The Birth of Modern Science*, p. 70.
2. Koestler, *The Sleepwalkers*, p. 392.
3. [illegible]Rattansi,“Newton and the Wisdom of the Ancients,”p. 189.
4. [illegible]1738[illegible]“[illegible]”[illegible]Curtis Wilson,“ Kepler’s Laws[illegible]So-Called,”*HAD News* (newsletter of the Historical Astronomy Division of the American Astronomical Society), No. 31, May 1994.
5. Giorgio de Santillana, *The Crime of Galileo*, p. 106fn.
6. [illegible]
7. [illegible]
8. Ferguson, *Tycho and Kepler*, pp. 31–32.

9. Gingerich,“Johannes Kepler and the New Astronomy,”p. 350.
10. Koestler, *The Sleepwalkers*, p. 278.
11. Ibid.,p. 345.

[illegible]

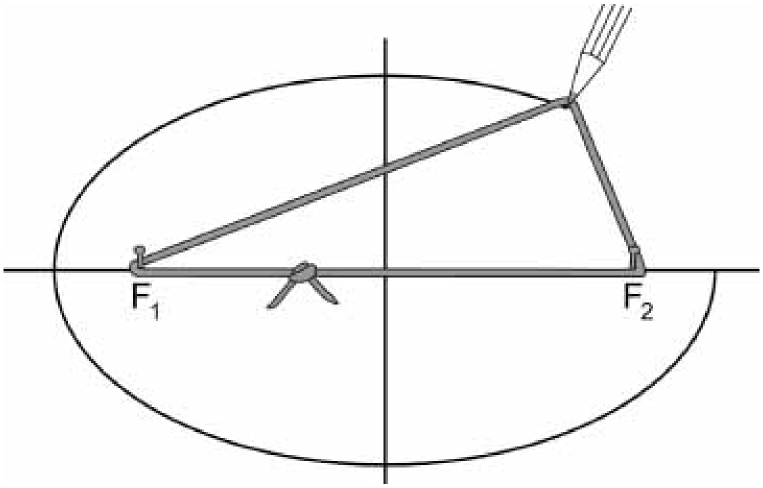
[illegible]

[illegible]——[illegible]3[illegible]7[illegible]1[illegible]2[illegible]12[illegible]30[illegible]——[illegible]3[illegible]7[illegible]14[illegible]4[illegible] 5[illegible]

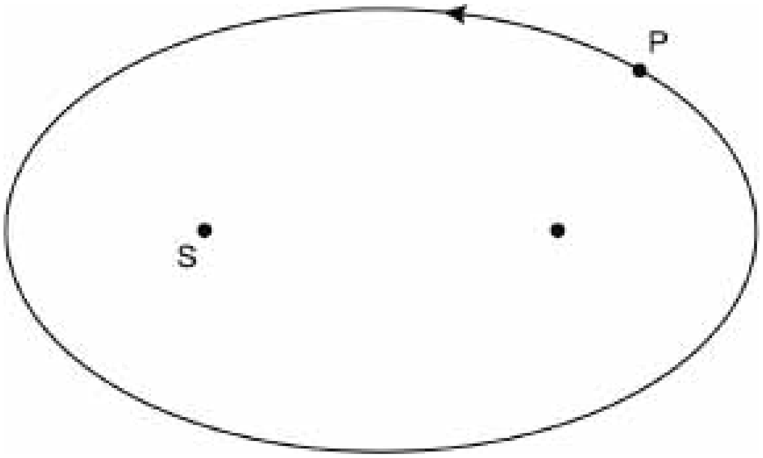
[illegible][注][illegible]

[illegible]——[illegible][引][illegible]“[illegible]·[illegible]”[illegible]“[illegible]”[引][illegible]

[illegible]“[illegible]”[引][illegible]



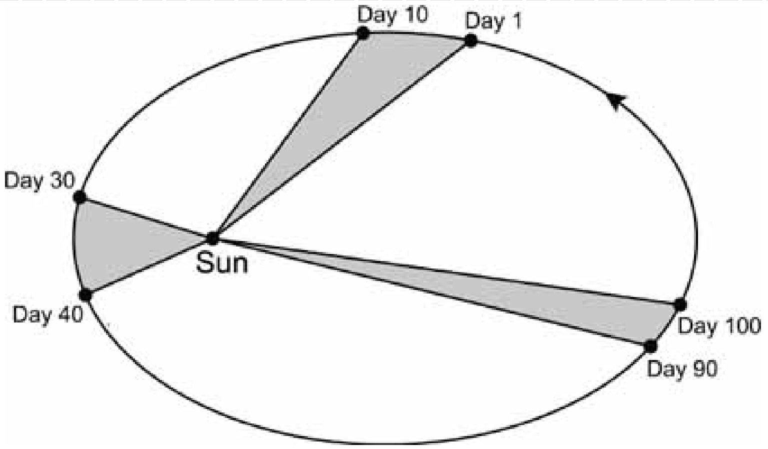
F_1 F_2



***

[illegible]

[illegible]



[illegible]

[illegible]“[illegible]”[illegible]

[illegible]

[illegible]——[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]——[illegible]“[illegible]”[illegible]

[illegible]

[illegible]“[illegible]1618[illegible]3[illegible]8[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”

[illegible]

[illegible]1.53[illegible]1.88[illegible]1.53×1.53×1.53=1.88×1.88[illegible]——[illegible]3[illegible]2[illegible]

[illegible]

[illegible]

[illegible]

1. [illegible]
2. Kuhn, *The Copernican Revolution*, pp. 211–12.
3. Koestler, *The Sleepwalkers*, p. 322.
4. Livio, *Is God a Mathematician?,*p. 249.
5. [illegible]
6. De Santillana, *The Crime of Galileo*, p. 106fn.
7. Koestler, *The Sleepwalkers*, p. 397.
8. Ibid.,p. 394.
9. Ferguson, *Tycho and Kepler*, p. 340.
10. Joseph Mazur provides this example in *The Motion Paradox*, p. 91.

[illegible]

[illegible]——[illegible]

[illegible]“[illegible]17[illegible]”[illegible]·[illegible]“[illegible]”[引][illegible]“[illegible]”[illegible]to be or not to be[illegible]$E=MC^2$[illegible]

[illegible]“[illegible]”[illegible][引]

[illegible]*New Astronomy*[illegible][引][illegible]

[illegible]——[illegible]

[illegible][注][illegible]Simplicio[illegible]Simplicius[illegible]“[illegible]”[illegible]“[illegible]”[illegible]simpleton[illegible]“sempliciotto”[illegible]

[illegible]

[illegible]“[illegible]15[illegible]20[illegible]”[illegible]“[illegible]”[引]

[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]——[illegible]——[illegible]

[illegible]——[illegible]

[illegible]

[illegible]——[illegible]——[illegible]

[illegible]

[illegible]——[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]

[illegible]

[illegible]

[illegible]——[illegible]

[illegible]
——[illegible]

[illegible]

[illegible]

“[illegible]”[illegible]“[illegible]”

[illegible]18[illegible]

[illegible]70[illegible]

[illegible]70[illegible]

[illegible]100[illegible]

“[illegible]”[引][illegible]·[illegible]1690[illegible]

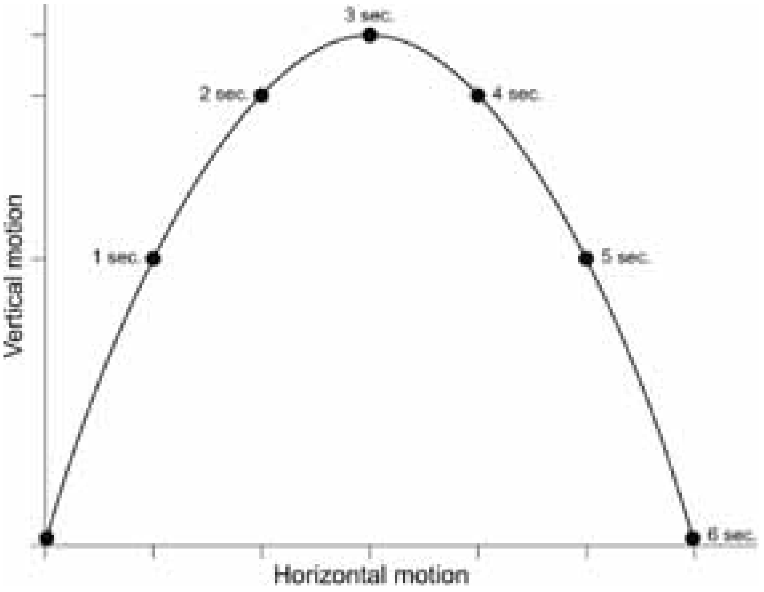
1. Bertrand Russell, *The Scientific Outlook*, p. 34.
2. Quoted in de Santillana, *The Crime of Galileo*, p. 115.
3. Ibid.,pp. 106fn.,168.
4. [illegible]1632[illegible]
5. Ibid.,p. 112.
6. Galileo, *The Assayer*.
7. Galileo, *Dialogue Concerning the Two Chief World Systems.*[illegible]
8. Locke, *Essay Concerning Human Understanding*, p. 98.

[illegible]

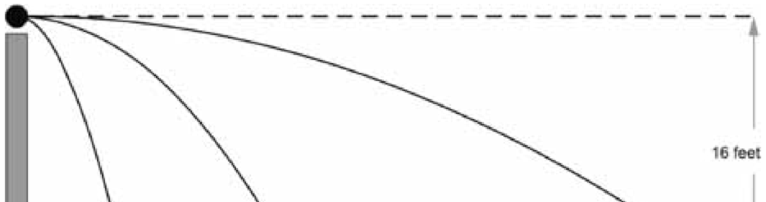
[illegible]“[illegible]”[illegible]The Red-Headed League[illegible]“[illegible]”[illegible]

[illegible]

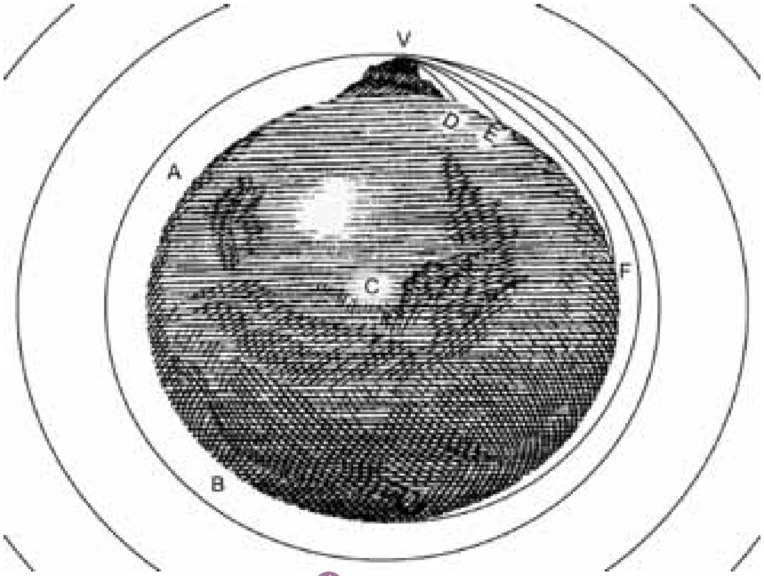
[illegible]——[illegible]



[illegible]——[illegible]——[illegible]


16 feet

[illegible]



1687[illegible][注]

1. [illegible]
2. The passage is from Galileo’s *Two New Sciences*, quoted in David Goodstein and Judith Goodstein, *Feynman’s Lost Lecture*, p. 38.
3. [illegible]1687[illegible]*A Treatise of the System of the World*, a less mathematical treatment of the *Principia*. See John Roche, “Newton’s *Principia*,” in Fauvel et al., eds., *Let Newton Be!*, p. 58.

[illegible]

[illegible]

[illegible]17[illegible]“[illegible]”[illegible]“[illegible]”[引]

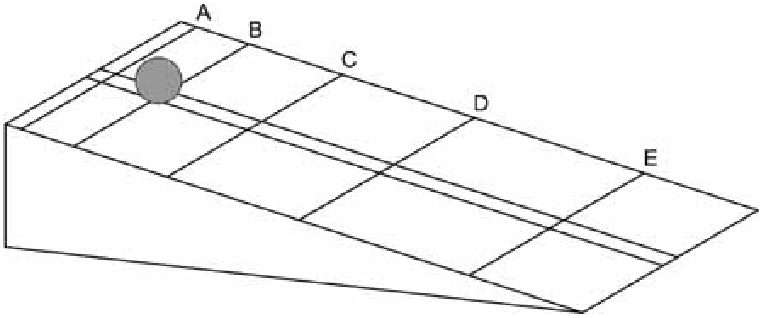
[illegible]——[illegible]

[illegible]——[illegible]——[illegible][注][illegible]“[illegible]”[引][illegible]“[illegible]”[注]

[illegible]——[illegible]——[illegible]——[illegible]——[illegible]

[illegible]——[illegible][注][illegible]“[illegible]”[illegible]

[illegible]



[illegible]A[illegible]A[illegible]B[illegible]B[illegible] C[illegible]C[illegible]D[illegible]

[illegible]

	时间（秒）	距离（英寸）
起点到细绳A	1	1
细绳A到细绳B	1	3
细绳B到细绳C	1	5
细绳C到细绳D	1	7
细绳D到细绳E	1	9

[illegible]

	时间（秒）	距离（英寸）
起点到细绳A	1	1
起点到细绳B	2	4
起点到细绳C	3	9
起点到细绳D	4	16
起点到细绳E	5	25

[illegible]——1[illegible]2[illegible]3[illegible]——[illegible]t[illegible]t^2[illegible][注][illegible]1^2[illegible]2[illegible]2^2[illegible]5[illegible]5^2[illegible]

[illegible]——[illegible]——[illegible]

[illegible]——[illegible]“[illegible]”[illegible]

1. Shapin, *The Scientific Revolution*, p. 33.
2. [illegible]“[illegible]”[illegible]“[illegible]”Kline, *Mathematics in Western Culture*, p.287.
3. Gillispie, *The Edge of Objectivity*, p. 42.
4. [illegible]“[illegible]”“[illegible]”“[illegible]”[illegible]
5. [illegible]
6. [illegible]t[illegible]t^2[illegible]t^2[illegible]$3\times t^2$[illegible]$10\times t^2$[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] 30 [illegible] 10 [illegible]

“[illegible]”[illegible]——[illegible]——[illegible]

[illegible]——[illegible]——[illegible]

1. Crease, *The Prism and the Pendulum*, p. 31.
2. Ibid.,p. 32.
3. Barry Newman,“Now Diving: Sir Isaac Newton,” *Wall Street Journal*, August 13, 2008.

[illegible]

[illegible]

[illegible]·[illegible]

[illegible]1636[illegible]“[illegible]10[illegible]”[illegible]“[illegible]”[illegible][illegible]10[illegible]8[illegible]11[illegible]9[illegible]——[illegible]——[illegible]

[illegible]——[illegible]11[illegible]9[illegible] 38°[illegible]23°[illegible]——[illegible]——[illegible]——[illegible]

[illegible]“[illegible]”[illegible]

[illegible]——[illegible]——[illegible]“[illegible]”“[illegible]”“[illegible]”[illegible]——[illegible]——[illegible]

[illegible]——[illegible]X[illegible]Y[illegible]

[illegible]X[illegible]Y[illegible]X[illegible]Y[illegible]·[illegible]John Stuart Mill[illegible][注][illegible]“[illegible]”[引][illegible]

[illegible]

1. Alfred Hooper, *Makers of Mathematics* (Vintage, 1948),p. 209.
2. [illegible]
3. [illegible]“[illegible]”[illegible]·[illegible]Alfred Crosby[illegible]“[illegible]”[illegible]·[illegible]Salomon Bochner[illegible]*The Role of Mathematics in the Rise of Science* (Princeton, NJ: Princeton University Press, 1966), p. 40[illegible]Alfred Crosby, *The Measure of Reality: Quantification and Western Society, 1250–1600* (New York: Cambridge University Press, 1997),pp. 142–44[illegible]
4. [illegible]·[illegible]1806[illegible]1873[illegible]
5. Livio, *Is God a Mathematician?,*p. 86.

[illegible]

1637[illegible]“[illegible]”[illegible]Cartesian coordinates[illegible][注][illegible]“[illegible]”[illegible][引][illegible]“[illegible]ABC”[illegible]

[illegible]——[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[注][illegible]

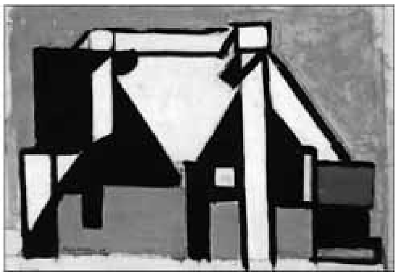
[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]‘[illegible]’[illegible]‘[illegible]’[illegible]”[illegible][引][illegible]——[illegible]23[illegible]203[illegible]20003[illegible]——[illegible]

[illegible]5[illegible]5[illegible]10[illegible]10[illegible]“[illegible]”[illegible][引][illegible]——1[illegible]5[illegible]10[illegible]10[illegible]

[illegible]“[illegible]”[注][illegible]“[illegible]”[illegible]-2×[illegible]-2[illegible]=4[illegible]

2×2[illegible]4[illegible]——[illegible]

[illegible]“2”“0[illegible]”[illegible]“[illegible]10[illegible]”[illegible]3[illegible]2[illegible]2+3=5[illegible]



[illegible]·[illegible]·[illegible]

[illegible]

[illegible]

[illegible]1[illegible]

[illegible]——[illegible]——[illegible]

[illegible]“[illegible]”[illegible]A.[illegible]·[illegible]A. Rupert Hall[illegible][注][illegible]“[illegible]”[注]

[illegible]“[illegible]……[illegible]”[illegible]“[illegible]……[illegible]”

[illegible]

1. [illegible]
2. E. T. Bell, *The Development of Mathematics*, p. 139.
3. Alfred North Whitehead, *Science and the Modern World*, p. 20.[illegible]“[illegible]”[illegible]
4. Newman, ed.,*The World of Mathematics*, vol. 1, p. 442.
5. Helena M. Pycior, *Symbols, Impossible Numbers, and Geometric Entanglements* (New York: Cambridge University Press, 2006),p. 82.
6. [illegible]17[illegible]
7. Eugene Wigner makes this point in his pathbreaking essay “The Unreasonable Effectiveness of Mathematics in the Natural Sciences.”
8. Butterfield, *The Origins of Modern Science*, p. 3.
9. [illegible]——[illegible]“[illegible]”[illegible]“[illegible]”[illegible]Russell Shorto, *Descartes’ Bones* (New York: Doubleday, 2008),p. 25.

10. [illegible]A. [illegible]·[illegible]1920[illegible]2009[illegible]

11. A. Rupert Hall, *From Galileo to Newton*, p. 63.[illegible]63[illegible]64[illegible]63[illegible]

[illegible]

[illegible]

[illegible]Zeno[illegible]450[illegible]“[illegible]”[illegible]

[illegible][注][illegible]

[illegible]“[illegible]”[illegible]

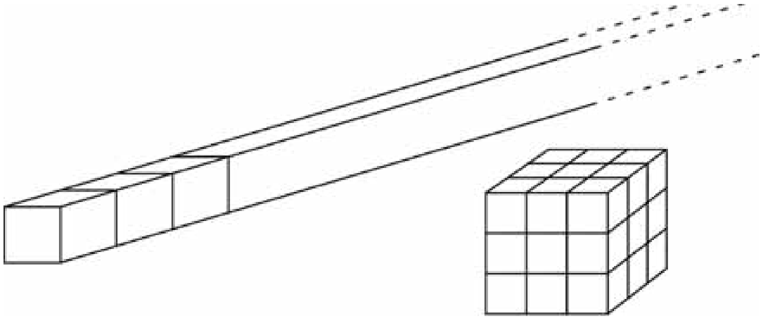
[illegible]

[illegible]——[illegible]

[illegible]“[illegible]”[illegible]·[illegible]Tobias Dantzig[illegible][注][illegible]“[illegible]”

[illegible]

[illegible]14[illegible]Albert of Saxony[illegible][引][illegible]1[illegible]1[illegible]



[illegible]

[illegible]1[illegible]

[illegible]3×3×3[illegible]5×5×5[illegible]

[illegible]1500[illegible]

[illegible]——[illegible]*a*[illegible]*e*[illegible]*i*[illegible]*o*[illegible]*u*[illegible]

[illegible]——[illegible]——[illegible]——[illegible]——[illegible]

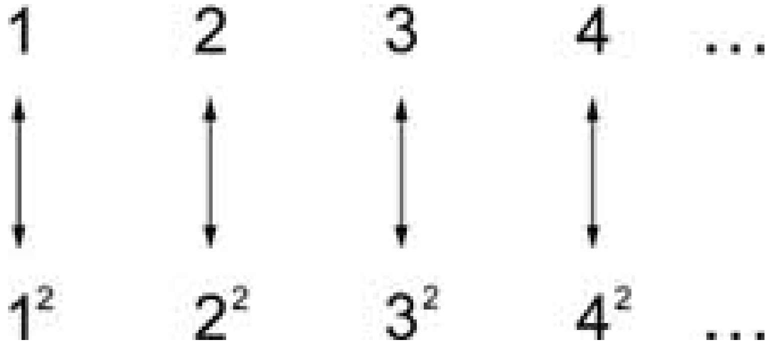
[illegible]

1 2 3 4……

[illegible]1^2, 2^2, 3^2, 4^2[illegible]1[illegible]4, 9, 16……[illegible]

1^2 2^2 3^2 4^2……

[illegible]1[illegible]4[illegible]9[illegible] 16……[illegible]



[illegible]1^2, 2^2, 3^2……[illegible]1, 2, 3……[illegible]——[illegible]

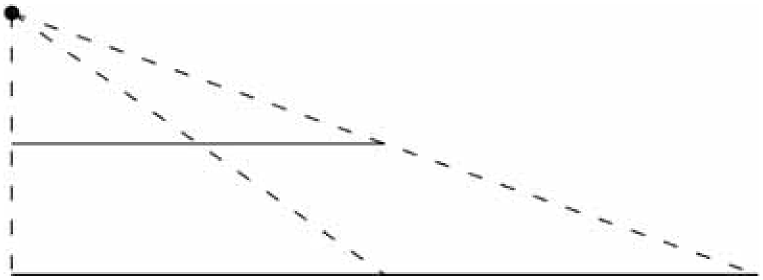
[illegible]

[illegible]100[illegible] 1000[illegible]1000[illegible]100[illegible] 1[illegible]1[illegible]1[illegible]1000[illegible]100[illegible]1[illegible] 1[illegible]1[illegible]

[illegible]·[illegible]James Joyce[illegible][注][illegible]*Portrait of the Artist as a Young Man*[illegible]“[illegible]”[illegible]“[illegible]100[illegible]100[illegible]100[illegible]……”

[illegible]

1. [illegible]·[illegible]·[illegible]Jorge Luis Borges, 1899[illegible]1986[illegible]
2. [illegible]·[illegible]1884[illegible]1956[illegible]
3. My discussion follows the one on pp. 52–55 of John Barrow's admirably lucid *The Infinite Book*.
4. [illegible]·[illegible]20[illegible]



[illegible]

[illegible]

[illegible]

[illegible][1] [illegible]

[illegible]

[illegible]

1. Struik, *A Concise History of Mathematics*, pp. 101–9.

[illegible]

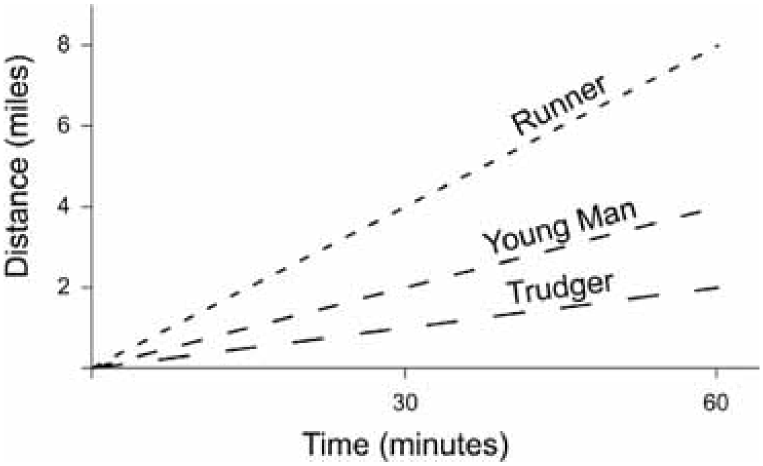
[illegible]2[illegible]4[illegible]8[illegible]

[illegible]

	30分钟	60分钟
跋涉者	1英里	2英里
年轻人	2英里	4英里
跑步者	4英里	8英里

[illegible]

[illegible]2[illegible]4[illegible]8[illegible]



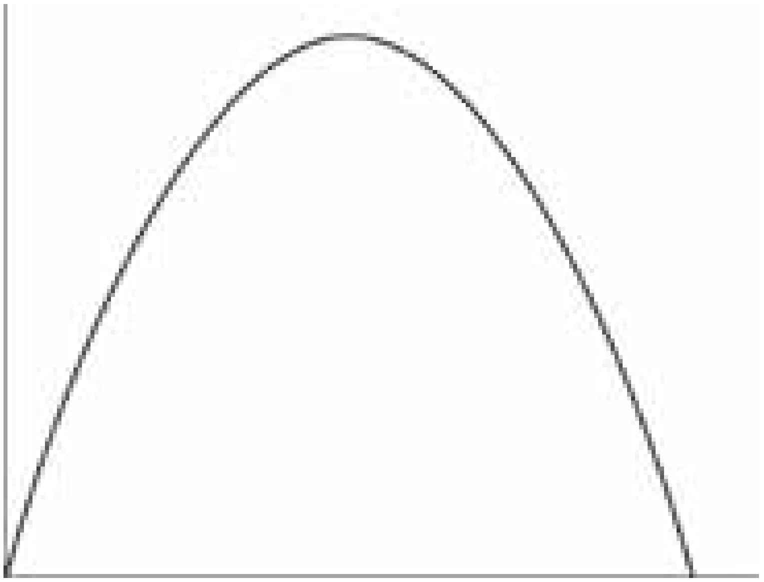
[illegible]2[illegible]

[illegible]“[illegible]2[illegible]”[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

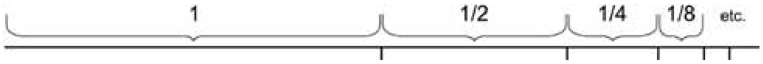
[illegible]——[illegible]——[illegible]X[illegible]S[illegible]

[illegible]——[illegible]——[illegible]

[illegible]

[illegible]“[illegible]”[illegible]

[illegible]



[illegible]1[illegible]1/2[illegible]1/4[illegible]

[illegible]

[illegible]

[illegible][注][illegible]

[illegible]——1+1/2+1/4+1/8+1/16+……——[illegible]

[illegible]——[illegible]100,[illegible]10[illegible]2[illegible]

[illegible]1[illegible]1/2[illegible]1/4[illegible]

1. [illegible]1[illegible]1/2[illegible]1/3[illegible]1/4[illegible]1/5[illegible]

[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible][注][illegible]·[illegible]“[illegible]”[illegible][注][illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]1, 0.1, 0.01, 0.001, 0.0001……[illegible]0[illegible]0[illegible]1/2, 3/4, 5/6, 7/8, 9/10, 10/11……[illegible]1[illegible]1, 2, 1, 2, 1, 2……[illegible][注]

[illegible]16[illegible]17[illegible]1+1/2+1/4+1/8+1/16+……[illegible]1+1/2[illegible]1[illegible]1/2[illegible]1+1/2+1/4[illegible]1[illegible]3/4[illegible]1+1/2+1/4+1/8[illegible]1[illegible]7/8[illegible]2[illegible]——[illegible]——[illegible]

[illegible]17[illegible]1[illegible]2[illegible]

[illegible]——[illegible]——[illegible]12[illegible]12[illegible]12[illegible]1[illegible]12[illegible]30[illegible]12[illegible]15[illegible]12[illegible]……[illegible]

[illegible]17[illegible]“[illegible]1”[illegible]

[illegible]

[illegible]——[illegible]“[illegible]”[illegible]15[illegible]

[illegible]——[illegible]——[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]“[illegible]5000[illegible]”[illegible]“[illegible]”引[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]引[illegible]0[illegible]

[illegible]引“……[illegible]……[illegible]‘[illegible]’[illegible]……[illegible]”[illegible]“[illegible]”注[illegible]“[illegible]”引[illegible]“[illegible]”引[illegible]0[illegible]

[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]pebble[illegible][引]

[illegible]“[illegible]”[illegible][引][illegible][illegible][引][illegible]

[illegible]19[illegible]“[illegible]”[illegible]·[illegible][注][illegible]

“[illegible]”[illegible]“[illegible]”[引]

1. [illegible]1858[illegible]·[illegible]Stephen A. Douglas[illegible]
2. [illegible]1858[illegible]10[illegible]15[illegible] http://www.bartleby.com/251/72.html.
3. [illegible]1, 1, 1……[illegible]1[illegible]“[illegible]”[illegible]0.9, 0.99, 0.999……[illegible]1[illegible]
4. Kline, *Mathematics in Western Culture*, p. 230.
5. Carl Boyer, *The History of the Calculus and Its Conceptual Development*, p. 213.
6. William Dunham, *The Calculus Gallery*, p. 24.
7. [illegible]·[illegible]·[illegible]Kline, *Mathematics*: *The Loss of Certainty*, p. 137.
8. Ibid.,p. 135.
9. Ibid.,p. 134.
10. Donald Benson, *A Smoother Pebble: Mathematical Explorations*, p. 167.
11. George Berkeley, *The Analyst: or A Discourse Addressed to an Infidel Mathematician* (London, 1754), p. 34.
12. Dunham, *The Calculus Gallery*, p. 24, and Kline, *Mathematics: The Loss of Certainty*, p. 140.

13. [illegible]·[illegible]·[illegible]Jean le Rond D’Alembert, 1717[illegible]1783[illegible]
[illegible]
14. Kline, *Mathematics: The Loss of Certainty*, p. 162.

[illegible]

[illegible]

[illegible]——[illegible]——[illegible]

[illegible]——[illegible]

[illegible]“[illegible]”[illegible]1665[illegible]1667[illegible]18[illegible]22[illegible]

[illegible]注[illegible]

[illegible]Stourbridge Fair[illegible]注[illegible]·[illegible]John Bunyan[illegible]注[illegible]“[illegible]”[illegible]“[illegible]”引[illegible]

[illegible]“1663[illegible]”[illegible]——[illegible]——[illegible]

[illegible]“[illegible]”[illegible][引][illegible]“[illegible]”

[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]1665[illegible][注][illegible]“[illegible]”[illegible]

[illegible]“[illegible]5[illegible]…… 11[illegible]1[illegible]5[illegible]……”[引]

[illegible]18[illegible]1665[illegible]“[illegible]”[illegible]“[illegible]1665[illegible]1666[illegible]”[引]

[illegible]23[illegible]26[illegible]25[illegible]·[illegible]Niels Bohr[illegible][注] 28[illegible]“[illegible]30[illegible]”[引][illegible]·[illegible]

[illegible]26[illegible]·[illegible]Paul Dirac[illegible][注][illegible]20[illegible]

[illegible]

[illegible]

[illegible]

[illegible]30[illegible][引]

[illegible]——[illegible]——[illegible]·[illegible]Bobby Fischer[illegible][注][illegible]12[illegible]

[illegible]“[illegible]”[illegible]·I. [illegible]Isidor I. Rabi[illegible][注][illegible]“……[illegible]……[illegible]——[illegible]……[illegible]”[引]

[illegible]“[illegible]——[illegible]”[illegible][引][illegible]80[illegible]“[illegible]”

35[illegible]40[illegible]40[illegible]37[illegible]37[illegible]41[illegible]42[illegible]——[illegible]

[illegible]“[illegible]——[illegible]·[illegible]John Wallis[illegible][注]——[illegible]”[引]

[illegible][引][illegible]“[illegible]”[引][illegible]“[illegible]”[illegible]

[illegible]Isaacus Nevtonus[illegible]Ieova sanctus unus[illegible]“[illegible]”[illegible][引][illegible]“[illegible]”[引]

[illegible]“[illegible]24[illegible][注][illegible]”[illegible]·[illegible]Richard Westfall[illegible][注][illegible]“[illegible]”[引]

[illegible]23[illegible]“1665[illegible]60[illegible]”[引]

1. [illegible]·[illegible]Richard Westfall[illegible]D. T. [illegible]D. T. Whiteside[illegible]·[illegible]Issac Barrow[illegible]Mordechai Feingold’s“Newton, Leibniz, and Barrow, Too: An Attempt at a Reinterpretation,”*Isis* 84, no. 2 (June 1993),pp. 310–38.
2. [illegible]*A Pilgrim’s Progress*[illegible] See Edmund Venables, *Life of John Bunyan* (London: Walter Scott, 1888), p. 173.
3. [illegible]·[illegible]1628[illegible]1688[illegible]
4. Gale Christianson, *In the Presence of the Creator: Isaac Newton and his Times*, p. 258.
5. D. T. Whiteside,“Isaac Newton: Birth of a Mathematician,”p. 58.
6. Westfall, *Never at Rest*, p. 98.

7. [illegible]“[illegible]/[illegible]”[illegible]“[illegible]”[illegible]
8. Ibid.,p. 143.
9. Ibid.
10. [illegible]·[illegible]1885[illegible]1962[illegible]1922[illegible]“[illegible]”[illegible]
11. Author interview, in Edward Dolnick,“New Ideas and Young Minds,”*Boston Globe*, April 23, 1984.
12. [illegible]·[illegible]1902[illegible]1984[illegible]1933[illegible]
13. Quoted in Dean Simonton, *Creativity in Science* (New York: Cambridge University Press, 2004),p. 68.
14. [illegible]“[illegible]”[illegible]
15. [illegible]·I. [illegible]1898[illegible]1988[illegible]1944[illegible]
16. Barrow, *Pi in the Sky*, p. 165.
17. Author interview, in Dolnick,“New Ideas”.
18. [illegible]·[illegible]1616[illegible]1703[illegible]
19. Westfall, *Never at Rest*, p. 139.
20. Gale Christianson,“Newton the Man—Again.”
21. Christianson, *In the Presence of the Creator*, p. 260.
22. Christianson, *Isaac Newton*, p. 58. The verse is Isaiah 45:3.
23. [illegible]
24. [illegible]·[illegible]1924[illegible]1996[illegible]17[illegible]
25. Westfall, *Never at Rest*, p. 137.
26. Ibid.,p. 138.
27. Ackroyd, *Newton*, p. 39.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] Dr. Pangloss [illegible]

[illegible]

[illegible]

[illegible]——[illegible]——[illegible]

[illegible]

[illegible]——[illegible]——[illegible]“[illegible]”[illegible]·[illegible]Ernst Cassirer[illegible][注][illegible]“[illegible]……[illegible]”[illegible][引]

[illegible]

1. [illegible]
2. Westfall, *Never at Rest*, p. 863.
3. I. Bernard Cohen’s translation of *Principia* (Berkeley: University of California Press, 1999),p. 428.
4. [illegible]·[illegible]1874[illegible]1945[illegible]
5. Ernst Cassirer,“Newton and Leibniz,”p. 379.

[illegible]

[illegible]“[illegible]”[illegible]“[illegible]·[illegible]·[illegible]”[引][illegible]“[illegible]”[illegible][引][illegible]“[illegible]”“[illegible]”“[illegible]”[illegible]

[illegible]“[illegible]”[引][illegible]

[illegible]“[illegible]”[引]

[illegible]“[illegible]‘[illegible]’”[引]

[illegible]100000[illegible][引][illegible]“[illegible]”[illegible]1000[illegible]60[illegible]

[illegible]·[illegible]“[illegible]”[引][illegible]

[illegible]0[illegible]1[illegible][注][illegible]

[illegible]——[illegible]·[illegible]——[illegible]“[illegible]”[illegible]“[illegible]1[illegible]0[illegible]”[引]

[illegible]26[illegible]1672[illegible]

[illegible]

[illegible]26[illegible]“[illegible]”[引][illegible]

[illegible]·[illegible]（Christiaan Huygens[illegible]“[illegible]‘[illegible]’[illegible]”[illegible][引]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]1675[illegible]30[illegible]

[illegible]——[illegible]——[illegible]9[illegible]

[illegible]

[illegible]——[illegible]15000[illegible][引]——[illegible]

[illegible]1672[illegible]·[illegible][引][illegible]

[illegible][注][illegible]——[illegible]

[illegible]1684[illegible]“6accdael3eff7i319n4o4qrr4s8tl2ux”[illegible][引][illegible][引]

[illegible]“[illegible]”[illegible]

1. C. H. Edwards, Jr.,*The Historical Development of the Calculus*, p. 231.
2. Leibniz’s letter can be found at www.leibniz-translations.com, a marvelous website run by the English philosopher Lloyd Strickland. See http://www.leibniz-translations.com/dog.htm,“Account of a Letter from Mr. Leibniz to the Abbé de St. Pierre, on a Talking Dog.”
3. Wiener,“Leibniz’s Project.”
4. Stewart, *The Courtier and the Heretic*, p. 256.
5. Umberto Eco, *The Search for the Perfect Language*, p. 281.(See Chapter 14, “From Leibniz to the *Encyclopédie*.”)

6. Author interview with Lawrencc Carlin, philosophy department at the University of Wisconsin at Oshkosh, July 15, 2008.
7. Russell, *History of Western Philosophy*, p. 581.
8. [illegible]·[illegible]Thomas Harriot[illegible]18[illegible]
9. George Dyson, *Darwin Among the Machines*, p. 37.
10. Joseph E. Hofmann, *Leibniz in Paris 1672–1676: His Growth to Mathematical Maturity*, p.2.
11. Dunham, *The Calculus Gallery*, p. 21.
12. Stewart, *The Courtier and the Heretic*, p. 138.
13. A. Rupert Hall, *Philosophers at War*, p. 54.
14. [illegible]2009[illegible]9[illegible]27[illegible]·[illegible]
15. Westfall, *Never at Rest*, p. 265.
16. Hall, *Philosophers at War*, p. 77.

[illegible]

[illegible]

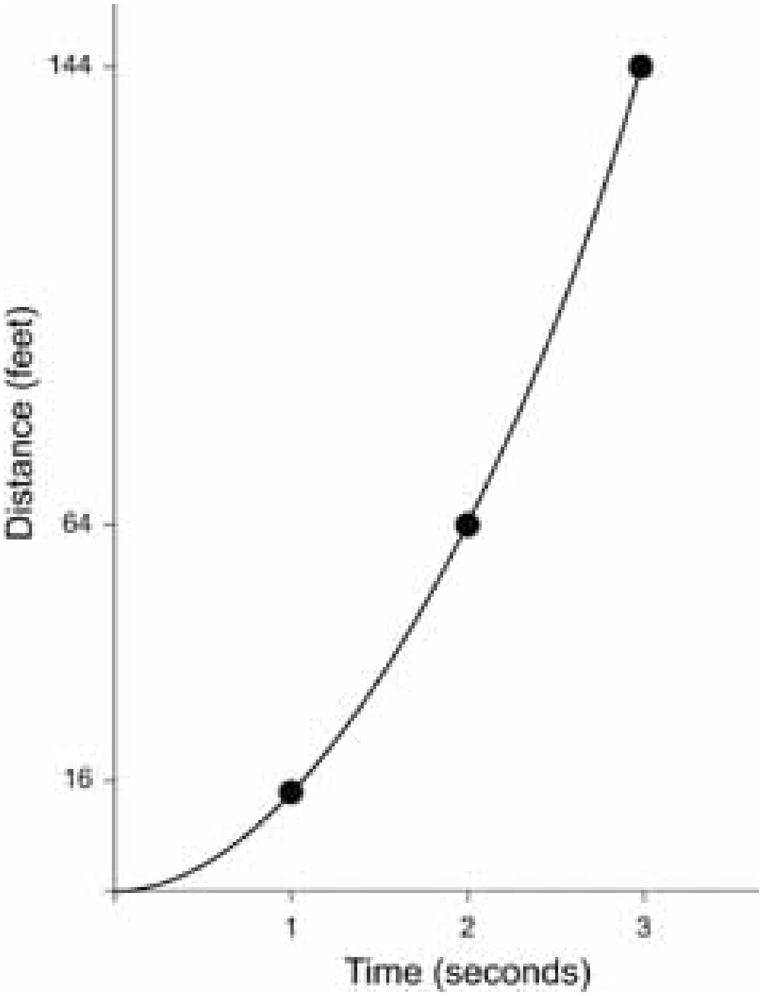
[illegible]——[illegible]64[illegible]128[illegible] 1000[illegible]100000[illegible]

[illegible]——[illegible]——[illegible]

时间（秒）	距离（英尺）
1	16
2	64
3	144

[illegible]$d=16t^2$[illegible]t[illegible]“[illegible]”[illegible]d[illegible]“[illegible]”[illegible]1[illegible]16×1[illegible]16[illegible]2[illegible]16×4[illegible]64[illegible]16×9[illegible]144[illegible]

[illegible]$t=0$[illegible] 0[illegible]1[illegible]16[illegible]2[illegible]64[illegible]



[illegible]t[illegible]$d=16t^2$[illegible]

[illegible]——[illegible]——[illegible]“[illegible]”[illegible]

[illegible]36[illegible]

[illegible]

[illegible]

[illegible] $t=1$ [illegible]

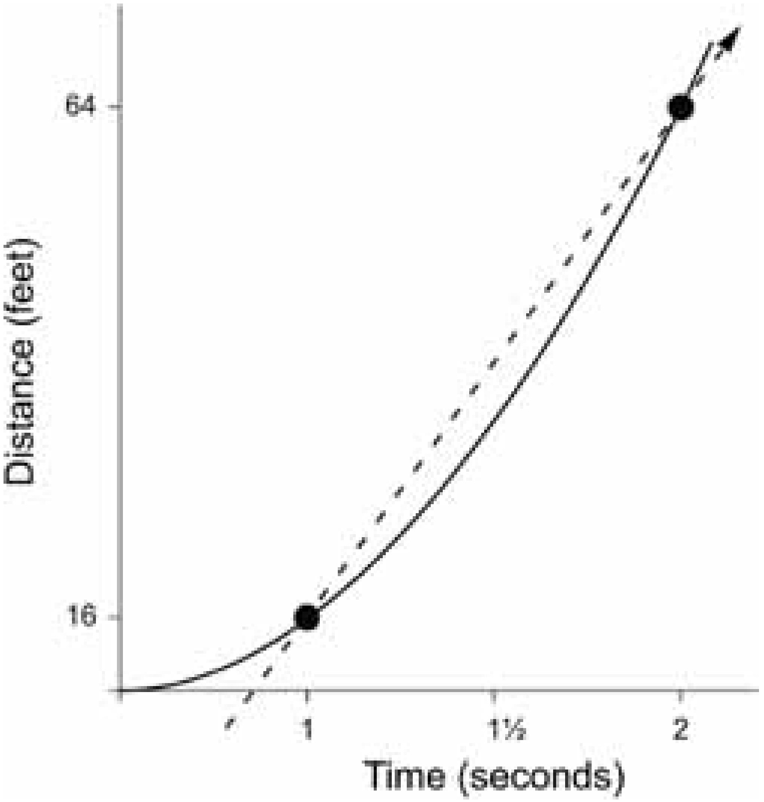
[illegible] 60 [illegible] 3 [illegible]

[illegible]

[illegible] $t=1$ [illegible] $t=2$ [illegible]

[illegible] 1 [illegible] $t=1$ [illegible] 16 [illegible] $t=2$ [illegible] 64 [illegible]

[illegible] —— [illegible] 16 [illegible] 64 [illegible] 1 [illegible] 2 [illegible] (64-16) [illegible] /(2-1) [illegible] 48 [illegible]

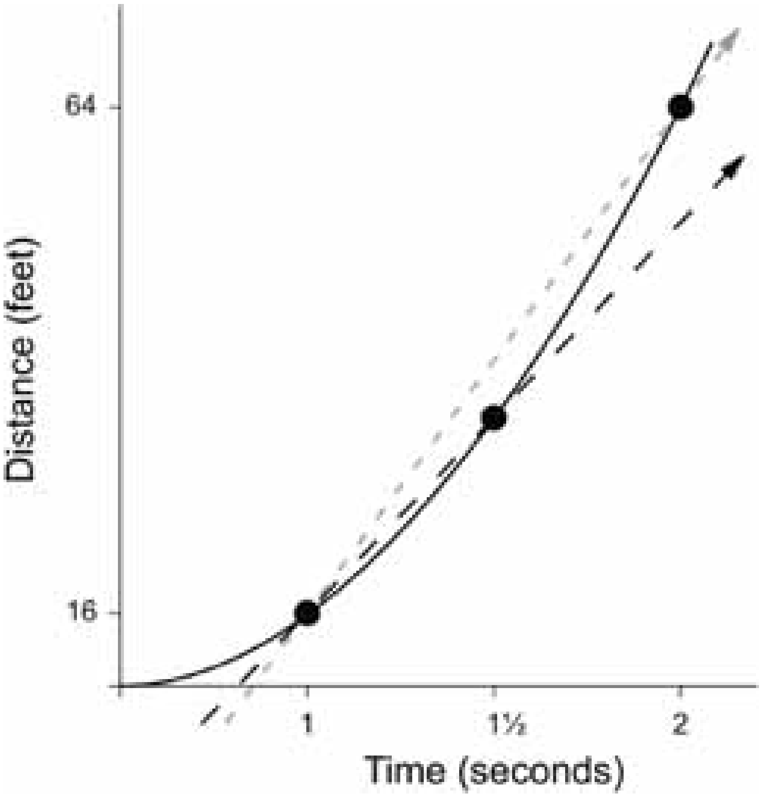


[illegible]$t=1$[illegible]$t=2$[illegible]1[illegible]

[illegible]48[illegible]1[illegible]$t=1$[illegible]

[illegible]$t=1$[illegible]1[illegible]

[illegible]$t=1$[illegible]$t=1$[illegible]1/2[illegible]$t=1$[illegible]



[illegible]t=1[illegible]t=1[illegible]1/2[illegible]

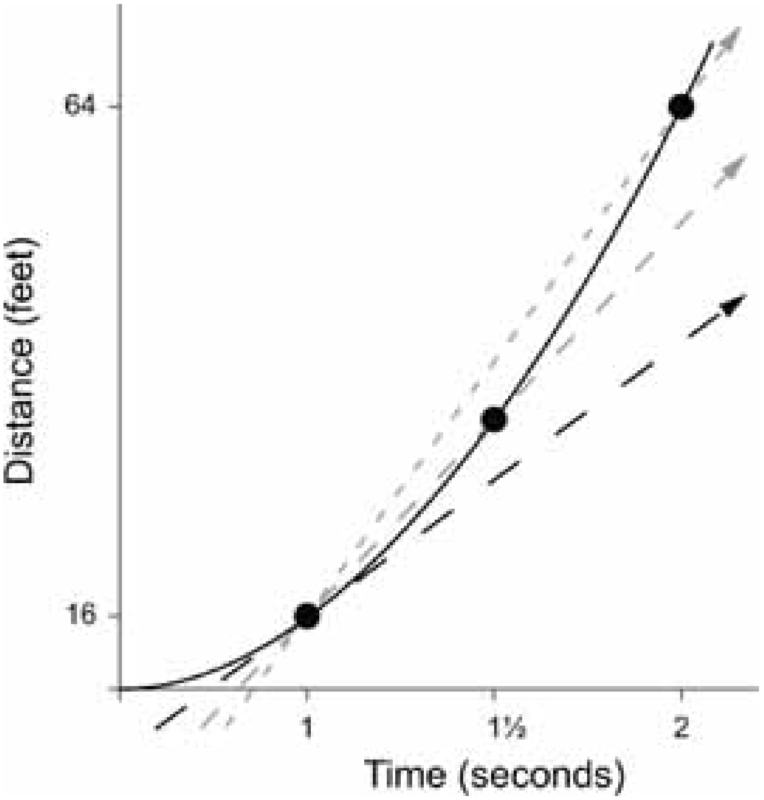
***

[illegible]t=1[illegible]t=1[illegible]t=1[illegible]1/4[illegible]t=1[illegible]t=1[illegible]1/8[illegible]

[illegible]t=1[illegible]

[illegible]“[illegible]”[illegible]——[illegible]t=1[illegible]——[illegible]——[illegible]

[illegible]



[illegible]$t=1$[illegible]

[illegible]“[illegible]”[illegible]

[illegible]1[illegible]32[illegible]——32[illegible]16×2[illegible]$d=16t^2$[illegible]16[illegible]2[illegible]

[illegible]t[illegible]$32t$[illegible]2[illegible]64(32×2)[illegible]2[illegible]1/2[illegible]80(32×2[illegible]1/2)[illegible]3[illegible]96(32×3)[illegible]

[illegible]

[illegible]——[illegible]——[illegible]

[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible][1]

1. Bell, *The Development of Mathematics*, p. 134.

[illegible]

[illegible]——[illegible]——[illegible] $d=16t^2$ [illegible]

[illegible] t [illegible] $16t^2$ [illegible] t^2 [illegible] t [illegible] i [illegible] $32t$ [illegible] v [illegible] $v=32t$ [illegible]

[illegible] t^2 [illegible] t [illegible] t [illegible] 1 [illegible] 5.3 [illegible] 50 [illegible]

[illegible]

[illegible] 80 [illegible] 80 [illegible]——[illegible]——[illegible]

[illegible][注] [illegible] 1 [illegible] 10 [illegible] 32 [illegible] 1 [illegible] 32 [illegible]

时间 (以秒计算)	位置 (英尺)	速度 (英尺/秒)	加速度 (英尺/二次方秒)
1	16	32	32
2	64	64	32
3	144	96	32

[illegible]

[illegible]——[illegible][注]——[illegible]

“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]·[illegible]Ian Stewart[illegible][注][illegible]“[illegible]‘[illegible]’[illegible]——[illegible]”

[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]——[illegible]——[illegible]

[illegible]

[illegible]——[illegible]32[illegible]

[illegible]“[illegible]”[引]

[illegible]——[illegible]Chesapeake Bay[illegible][注][illegible]

[illegible]

[illegible]1[illegible]1[illegible]“12[illegible]”[illegible]“13[illegible]”“14[illegible]”[illegible]20[illegible]

[illegible]——[illegible]——[illegible]

[illegible]“[illegible]”[illegible]

1. [illegible]Ian Stewart, *Nature’s Numbers*, pp. 50–52.
2. [illegible]
3. [illegible]·[illegible]
4. Stewart, *Nature’s Numbers*, p. 15.
5. Marcel Proust, *Swann’s Way*, trans. Lydia Davis (New York: Viking, 2003),p. 51.
6. [illegible]“[illegible]”[illegible]
7. Paul Nahin, *When Least is Best*, p. 165.[illegible]
8. [illegible]·[illegible]Edmond Halley, 1656[illegible]1742[illegible]
9. Dunham, *The Calculus Gallery*, p. 19, quoting James Gregory.

[illegible]

[illegible]1693[illegible]“[illegible]”[illegible][注][illegible]“[illegible]”[引][illegible]

[illegible]1701[illegible]“[illegible]”[引]

[illegible]

[illegible]

[illegible]18[illegible]15[illegible]“[illegible]”[illegible]

[illegible]·[illegible]“[illegible]”[引][illegible]

***

[illegible]1714[illegible]

[illegible]54[illegible]·[illegible]Georg Ludwig[illegible]

[illegible]“[illegible]”[引][illegible]·[illegible]·[illegible]·[illegible]

[illegible]·[illegible]40[illegible]·[illegible]

[illegible]·[illegible]1704[illegible]*Opticks*[illegible] 1705[illegible]·[illegible]——“[illegible]”[illegible][引][illegible]——[illegible]

[illegible]62[illegible]parrot[illegible]parabola[illegible]

[illegible]–[illegible]——[illegible][引][illegible]——[illegible]

[illegible][引][illegible]·[illegible]·[illegible]Sophia Dorothea[illegible]·[illegible]32[illegible]

[illegible]·[illegible]·[illegible]

[illegible]·[illegible]·[illegible]21[illegible]·[illegible]1714[illegible]

[illegible]“[illegible]”[1]

[illegible]1000[illegible]

[illegible]“[illegible]”[illegible][2]

[illegible]——[illegible]——[illegible]·[illegible]–[illegible]“[illegible]”[3][illegible]

[illegible]“[illegible]”[4][illegible]“[illegible]”[5][illegible]“[illegible]”[6]

[illegible]

1. Hall, *Philosophers at War*, p. 111.[illegible]
2. Ibid.,p. 112.
3. Westfall, *Never at Rest*, p. 721.

4. Boorstin, *The Discoverers*, p. 413.
5. William Henry Wilkins, *The Love of an Uncrowned Queen: Sophia Dorothea, Consort of George I* (New York: Duffield, 1906),p. 72.
6. Macaulay, *History of England*, vol. 5, p. 190.
7. Plumb, *The First Four Georges*, p. 41.
8. The best source for the tangled affairs of the Hanover court is http://www.gwleibniz.com, a website maintained by the University of Houston philosopher Gregory Brown. See http://www.gwleibniz.com/sophie_dorothea_celle/sophie_dorothea_celle.html.
9. Gregory Brown,“Personal, Political, and Philosophical Dimensions of the Leibniz-Caroline Correspondence,”p. 271.
10. Ibid.,p. 292.
11. Ibid.,p. 262.
12. Ibid.,p. 282.
13. Quoted at <http://www.gwleibniz.com/caro oline_ansbach/caroline.html>.
14. Brown,“Leibniz-Caroline Correspondence,”p. 282.

[illegible]

[illegible]——[illegible]——[illegible]“[illegible]”[illegible]“[illegible]”[illegible][引][illegible]“[illegible]”[illegible][引]

[illegible]

“[illegible]”[illegible]·W. [illegible]Alfred W. Adler[illegible]“[illegible]”[引]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]1666[illegible]1704[illegible]9[illegible]1684[illegible]17[illegible]19[illegible]XVII[illegible]XIX[illegible][注]

[illegible]

[illegible]18[illegible]19[illegible]·[illegible]——“[illegible]/[illegible]‘[illegible]’[illegible]”——[illegible]

[illegible]1711[illegible]——[illegible]——[illegible]“[illegible]”[引][illegible]

[illegible]——[illegible]——[illegible]“[illegible]”[引][illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]——[illegible]——“[illegible]”[illegible][引]

[illegible]“[illegible]”[illegible][引]

1. Cited in Robert Merton’s classic essay “Priorities in Scientific Discovery: A Chapter in the Sociology of Science,”p. 635. Galileo’s charge comes at the very beginning of *The Assayer*.
2. Merton,“Priorities in Scientific Discovery,”p. 648.
3. Alfred Adler,“Mathematics and Creativity,”*New Yorker*, February 19, 1972.
4. [illegible]1+0.1+0.01+0.001+……=1.11111……[illegible]
5. Westfall, *Never at Rest*, p. 724.
6. Ibid.,p. 725.
7. The entire review is reprinted as an appendix to Hall’s *Philosophers at War*. The quoted passage appears on p. 298.
8. Charles C. Gillispie, “Isaac Newton,” in *Dictionary of Scientific Biography* (New York: Scribner’s, 1970–80), vol. 10.
9. William Whiston, *Historical Memoirs of the Life and Writings of Dr. Samuel Clarke* (London, 1748), p. 132.

[illegible]

[illegible]17[illegible]

[illegible]1687[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]·[illegible]John Conduitt[illegible]“[illegible]1666[illegible]……[illegible]”[illegible]“[illegible]……”[引]

[illegible][注][illegible][引][illegible][引][illegible][引][illegible]

[illegible]

[illegible]

[illegible]

[illegible]“[illegible]”[illegible][引][illegible]

[illegible]

[illegible]“[illegible]”[illegible]

[illegible]

[illegible]10[illegible]20[illegible]1/4[illegible]10[illegible]1/100[illegible]20[illegible]10[illegible]1/4[illegible]

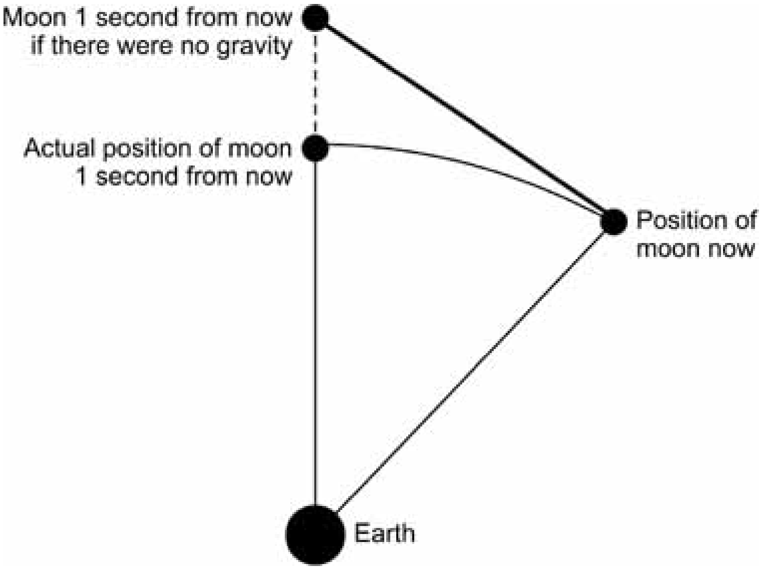
[illegible]“[illegible]”[illegible]

[illegible]

[illegible]“[illegible]”——[illegible]

[illegible]1[illegible]——[illegible]

□□□□□□□□□□□□□□□□□□□□□□□□□□□□
□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□
□□□□□“□□”□□□——□□□□□□□□□“□□”□□□□□□□



□□□□□□□1□□□□□□□□□□□□□□□□□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□1□□□□□□□□□□□□□□□□□□□1/20□□□□□□□□□1□□□□□□□□□□□□□□□□□□□□□□□16□□□

□□□□□□□□□□□□□□□□□□□□□□□□1/20□□□16□□60□□□□□□□□□□□□□□□□□□□□□□□□□□□60□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□1/3600□60×60)□

□□□□□□□□□□□□□□□□□□□□□1□□□□1/ 20□□□□□1□□□□16□□□1/20□□□16□□□□□□□□□□□□□□□□□□□□1:3600□□□□□□□□□□□□□□□□□□□□□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□“□□□□□□□□□□□□□□□□□□□□□”□□□□□□□□□“□□□□□□□□□□□”[引]□□“□□□”□□□□□□□□□□□□

1. Westfall, *Never at Rest*, p. 209.
2. Ibid.,p. 154.
3. □□□□□□□□“□□”□□□□□□□□□□□□□□□□□□□□□□□□□□□

4. Westfall discusses the evidence pro and con in *Never at Rest*, pp. 154–55, and is more inclined than many to give the story some credence.
5. Simon Schaffer,"Somewhat Divine," *London Review of Books*, November 16, 2000, reviewing I. Bernard Cohen's translation of Newton's *Principia.*
6. See Cohen's "Introduction" to his translation of the *Principia*, p. 15, and Schaffer,"Somewhat Divine."
7. Westfall, *Never at Rest*, p. 143.
8. I. Bernard Cohen,"Newton's Third Law and Universal Gravity,"p. 572.
9.

[illegible]

[illegible]

[illegible]20[illegible]20[illegible]

1684[illegible]1[illegible]·[illegible]·[illegible]·[illegible][注][illegible][引][illegible]“[illegible]”[illegible]

[illegible]3[illegible]3[illegible]——[illegible]

[illegible][引][illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible] 40[illegible]——[illegible]400[illegible]——[illegible]1684[illegible]8[illegible]28[illegible][引][illegible][引][illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]

“[illegible]”[illegible]“[illegible]”

[illegible]“[illegible]”[illegible]

1. [illegible]1660[illegible]9[illegible]25[illegible]“[illegible]”
2. Steven Shapin,“At the Amsterdam,”*London Review of Books*, April 20, 2006, reviewing *The Social Life of Coffee* by Brian Cowan. See also Mark Girouard, *Cities and People* (New Haven, CT: Yale University Press, 1985),p. 207.
3. Merton,“Priorities in Scientific Discovery,”p. 636.
4. Roche,“Newton’s *Principia*,”in Fauvel et al.,eds.,*Let Newton Be!*, p. 58.
5. Manuel, *A Portrait of Isaac Newton*, p. 318.
6. Alan Cook, *Edmond Halley: Charting the Heavens and the Seas* (New York: Oxford University Press, 1998), pp. 11, 140–41, 281.
7. Westfall, *Never at Rest*, p. 403.

[illegible]

[illegible]9[illegible]On the Motion of Bodies in an Orbit[illegible]

[illegible]“[illegible]”[illegible]注[illegible]

[illegible]——[illegible]

[illegible]

[illegible]17[illegible]

[illegible]·[illegible]引[illegible]“[illegible]”引[illegible]

“[illegible]”[illegible]“[illegible]”引[illegible]“[illegible]

[illegible]”引[illegible]“[illegible]……[illegible]”[illegible]

[illegible]17[illegible]注[illegible]“[illegible]‘[illegible]’[illegible]”引

[illegible]

[illegible]“[illegible]”[illegible]引[illegible]

[illegible]“[illegible]”引

[illegible]1686[illegible]4[illegible]9[illegible]500[illegible]200[illegible]“[illegible]17[illegible]”引

[illegible]“[illegible]”[illegible]

[illegible]P[illegible]S[illegible]AB[illegible]

[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]

[illegible]

1. [illegible]“[illegible]”[illegible]“[illegible]”[illegible]Bruce Pourciau,“Reading the Master: Newton and the Birth of Celestial Mechanics,”and Curtis Wilson,“Newton’s Orbit Problem.”
2. Dudley Herschbach,“Einstein as a Student,”available at http://tinyurl.com/yjptcq8.
3. This was from Einstein’s foreword to a new edition of Newton’s *Opticks*, published in 1931.
4. Westfall, *Never at Rest*, p. 405.
5. Ibid.,p. 192.
6. [illegible]1600[illegible]Plutarch[illegible]“[illegible]”[illegible]“[illegible]”[illegible]46[illegible]125[illegible]
7. Ibid.,p. 406.
8. Kuhn, *The Copernican Revolution*, p. 258.
9. Westfall, *Never at Rest*, p. 409.
10. Chandrasekhar,“Shakespeare, Newton, and Beethoven.”

11. Westfall, *Never at Rest*, p. 456.

[illegible]

[illegible]

[illegible]

[illegible]·[illegible]“[illegible]”[引]——[illegible]17[illegible]“[illegible]”[illegible]“[illegible]”——[illegible]

1686[illegible]5[illegible]22[illegible]“[illegible]”[illegible]“[illegible]……[illegible]”[引][illegible]“[illegible]”[引]

[illegible]“[illegible]”[注][illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]

***

[illegible]1684[illegible]

[illegible]“[illegible]”

[illegible]1671[illegible]6[illegible]6[illegible]

[illegible]

[illegible]7[illegible]1671[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”

[illegible]“[illegible]”[illegible]30[illegible]——[illegible]1704[illegible]1[illegible]——[illegible]

[illegible]1686[illegible]

[illegible]“[illegible]”[illegible]“[illegible]……”

[illegible]Salieri[illegible][引][illegible][引]

[illegible]1703[illegible][引]

1. Henry Richard Fox Bourne, *The Life of John Locke*, vol. 2 (New York: Harper Brothers, 1876), p. 514.
2. Westfall, *Never at Rest*, p. 446.
3. Manuel, *A Portrait of Isaac Newton*, p. 154.
4. Ibid.,p. 155.
5. Ibid.,p. 155.
6. Westfall, *Never at Rest*, pp. 387–88.
7. Ibid.,p. 233.
8. Ibid.,p. 237.
9. Ibid.,p. 237.
10. Ibid.,p. 448.
11. Manuel, *A Portrait of Isaac Newton*, p. 159.
12. Ibid.,p. 137.
13. Christianson, *Isaac Newton*, p. 106.

[illegible]

[illegible]“[illegible]”[引][illegible]

[illegible]——[illegible]

[illegible]8000[illegible]——[illegible]——[illegible]

[illegible][引][illegible]

[illegible]“[illegible]”[illegible]“[illegible]”

[illegible]

[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]·[illegible]“[illegible]”[注]

[illegible]——[illegible]——[illegible]

[illegible]75[illegible]

[illegible]

[illegible]1687[illegible]7[illegible]5[illegible][注][illegible]“[illegible]”[引][illegible]Lagrange[illegible][引]

[illegible]1685[illegible][引]

1. Westfall, *Never at Rest*, p. 450.
2. Martin Rees, *Just Six Numbers*, p. 150. See also Schaffer,“Somewhat Divine.”
3. [illegible]·[illegible]“[illegible]”[illegible]·[illegible]·[illegible]Edgar Allan Poe[illegible]“[illegible]——[illegible]——[illegible]”[illegible]·[illegible]“[illegible]”
4. [illegible]·[illegible]1687[illegible]
5. Westfall, *Never at Rest*, p. 437.
6. Morris Kline, *Mathematics in Western Culture*, p. 209.
7. Westfall, *Never at Rest*, p. 453.

[illegible]

[illegible]“[illegible]”[引][illegible][引][illegible]C. C. [illegible]“[illegible]”[引]

[illegible]A. [illegible]·[illegible][引][illegible]ABC[illegible]“[illegible]”[illegible]

[illegible]1919[illegible]“[illegible]12[illegible]”[引][illegible]“[illegible]”[illegible]·[illegible]Arthur Eddington[illegible][注][illegible]“[illegible]”[引]

[illegible]——[illegible][注][illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[引]

[illegible]——[illegible]——[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible][引]

[illegible]

[illegible]I. [illegible]·[illegible]“[illegible]——[illegible]——[illegible]”[引][illegible]“[illegible]”

[illegible]19[illegible]·[illegible]William Whewell[illegible]“[illegible]”[引]

1. Ibid.,p. 468.
2. Ackroyd, *Newton*, p. 89.
3. Gillispie, *The Edge of Objectivity*, p. 140.
4. Hall, *Philosophers at War*, p. 52.
5. “Lights All Askew in the Heavens,” *New York Times*, November 9, 1919, p. 17. See http://tinyurl.com/ygpam73.
6. [illegible]·[illegible]1882[illegible]1944[illegible]“[illegible]”[illegible]
7. Stephen Hawking, *A Brief History of Time* (New York: Bantam, 1998), p. 85.
8. I. [illegible]·[illegible]
9. Roche,“Newton’s *Principia,*”in Fauvel et al.,eds.,*Let Newton Be*!, p. 50.
10. Westfall, *Never at Rest*, p. 424.
11. Cohen,“Introduction,” p. 123.
12. Chandrasekhar,“Shakespeare, Newton, and Beethoven.”

[illegible]

[illegible]——[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[引][illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[注]20[illegible]·[illegible]“[illegible]”[illegible]

[illegible][注][illegible][注][illegible]——[illegible]

[illegible]“[illegible]”[引]

[illegible]“[illegible]”[illegible]“[illegible]——[illegible]”[引]

[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]——[illegible]

[illegible]65000[illegible]65000[illegible]

[illegible]

[illegible]1[illegible]8[illegible]

[illegible]17[illegible]

[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”

[illegible]……[illegible]——[illegible]

[illegible]

[illegible]“[illegible]”[illegible]1693[illegible]“[illegible]”

[illegible]1713[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]

1. Thomas Kuhn famously cited Molière in *The Structure of Scientific Revolutions*, p. 104.
2. [illegible]·[illegible]“[illegible]”Dael Wolfle, ed.,*Symposium on Basic Research* (Washington, DC: American Association for the Advancement of Science, 1959),p. 66.
3. [illegible]
4. [illegible]“[illegible]”[illegible]J. J. MacIntosh,“Locke and Bolye on Miracles and God’s Existence,”p. 196.
5. Brown,“Leibniz-Caroline Correspondence,”p. 273.
6. John Henry,“Pray do not Ascribe that Notion to me: God and Newton’s Gravity,”in Force and Popkin, eds.,*The Books of Nature and Scripture*, p. 141.
7. Brown,“Leibniz-Caroline Correspondence,”p. 291.
8. Brian Greene, *The Elegant Universe* (New York: Norton, 1999),p. 56.
9. Westfall, *Never at Rest*, p. 505.
10. From the end of *Opticks*, quoted in Kuhn, *The Copernican Revolution*, p. 259.
11. Westfall, *Never at Rest*, p. 779.
12. Ibid.,p. 505.
13. Cohen’s translation of the *Principia*, p. 428.

[illegible]

[illegible]——[illegible]17[illegible][注][illegible]

[illegible]

[illegible]

[illegible]“[illegible]”[引]

[illegible]——[illegible]

[illegible]19[illegible]——[illegible]——[illegible]

[illegible]“[illegible]”[illegible]17[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]

[illegible]“[illegible]”[illegible]“[illegible]——[illegible]——[illegible]”

[illegible]“[illegible]”

[illegible]

[illegible]

[illegible]“[illegible]”[illegible]·[illegible]William Whiston[illegible]“[illegible]”[illegible]

[illegible]“[illegible]·[illegible]”

[illegible]“[illegible]”[illegible]·[illegible]“……[illegible]”

[illegible]“[illegible]”[illegible]“[illegible]”[引][illegible]“[illegible]”[illegible]

[illegible]

[illegible][引][illegible]

[illegible]

[illegible]

1. [illegible]2009[illegible]11[illegible]“[illegible]”“Hacked E-Mail is New Fodder for Climate Change Dispute,”*New York Times*, November 21, 2009.
2. Cohen’s translation of the *Principia*, p. 427.
3. Dennis Todd,“Laputa, the Whore of Babylon, and the Idols of Science,”*Studies in Philology* 75, no. 1 (Winter 1978),p. 113.
4. Quoted in a brilliant, far-ranging essay by Steven Shapin,“Of Gods and Kings: Natural Philosophy and Politics in the Leibniz-Clarke Disputes,”p. 211.
5. Todd,“Laputa, the Whore of Babylon, and the Idols of Science,”p. 108.
6. Westfall, *Never at Rest*, p. 778.
7. Shapin,“Of Gods and Kings,”p. 193.
8. I owe this observation about Leibniz and politics to Martin Tamny,“Newton, Creation, and

Perception,”p. 54.

9. Shapin,“Of Gods and Kings,”p. 194.

[illegible]

1600[illegible]Giordano Bruno[illegible]

[illegible]·[illegible]1705[illegible]

[illegible]17[illegible]

[illegible]

[illegible]1846[illegible][注][illegible][引][illegible]·[illegible]·[illegible]Johann Gottfried Galle[illegible][注][illegible]1846[illegible]9[illegible]23[illegible]

[illegible]

[illegible]·[illegible][引][illegible]·[illegible]

[illegible]·[illegible]“[illegible]

[illegible]”[引][illegible]“[illegible]”[illegible]

[illegible]——[illegible]

18[illegible]-[illegible]·[illegible]Pierre-Simon Laplace[illegible][注][illegible]*Celestia Mechanics*[illegible]

[illegible]

“[illegible]”[引][illegible]

[illegible]1716[illegible]“[illegible]”[引][illegible]·[illegible]·[illegible]William Wordsworth[illegible][注][illegible]

[illegible]“[illegible]”[illegible]theory of everything[illegible]

[illegible]“[illegible]”[引]

[illegible]“[illegible]”[引]

[illegible]“[illegible]”[引][illegible]

[illegible]1980[illegible]1987[illegible]“[illegible]”

[illegible]“[illegible]——[illegible]‘[illegible]’[illegible]”

[illegible]The Earl of Pembroke[illegible]“[illegible]”[illegible][引][illegible]“[illegible]”[illegible]“[illegible]”

“[illegible]·[illegible]”[illegible]Aldous Leonard Huxley[illegible][注][illegible]“[illegible]”[引]

[illegible]·[illegible]*Never of Rest*[illegible]“[illegible]”[注][illegible]“[illegible]”[illegible]

[illegible]Marquis de L’Hôpital[illegible][注][illegible]“[illegible]”[引]

[illegible][引]

1. [illegible]·[illegible]·[illegible]·[illegible]Urbain Jean Joseph Le Verrier, 1811[illegible]1877[illegible]35[illegible]

2. Kline, *Mathematics: The Loss of Certainty*, pp. 62–63, and Kline, *Mathematics in Western Culture*, p. 210.
3. [illegible]·[illegible]·[illegible]1812[illegible]1910[illegible]1[illegible]
4. Bernard Bailyn, *To Begin the World Anew* (New York: Vintage, 2004),pp. 71–73.
5. I. Bernard Cohen, *Science and the Founding Fathers*, p. 90.
6. [illegible]-[illegible]·[illegible]1749[illegible]1827[illegible]“[illegible]”[illegible]“[illegible]”[illegible]
7. Kline, *Mathematics in Western Culture*, p. 210.
8. Westfall, *Never at Rest*, p. 779.
9. [illegible]·[illegible]1770[illegible]1850[illegible]
10. Brown,“Leibniz-Caroline Correspondence,”p. 285.
11. Stewart, *The Courtier and the Heretic*, p. 306.
12. Ibid.,p. 117, quoting Eike Hirsch.
13. Milo Keynes discusses Newton’s views on art and literature in “The Personality of Isaac Newton,”pp. 26–27.
14. [illegible]·[illegible]·[illegible]1894[illegible]1963[illegible]·[illegible]·[illegible]
15. from an interview with Huxley in J. W. N. Sullivan, *Contemporary Mind* (London: Toulmin, 1934), p. 143.
16. [illegible]300[illegible]See Edward Dolnick,“Sir Isaac Newton,”*Boston Globe*, July 27, 1987.[illegible]p. x[illegible]“[illegible]”[illegible]
17. [illegible]1661[illegible]1704[illegible]·[illegible]
18. Westfall, *Never at Rest*, p. 473.
19. Ibid.,p. 194.

[illegible]

[illegible]·[illegible]Fred Solomon[illegible]·[illegible]Gene Dolnick[illegible]

[illegible]·[illegible]Rebecca Grossman[illegible]·[illegible]Mike Briley[illegible]·[illegible]Cole Miller[illegible]·[illegible]Larry Carlin[illegible]·[illegible]Steven Shapin[illegible]17[illegible]·[illegible]Owen Gingerich[illegible]·[illegible]Simon Schaffer[illegible]

[illegible]·[illegible]Michele Missner[illegible]·[illegible]Katerina Barry[illegible]·[illegible]Rob Crawford[illegible]·[illegible]·[illegible]Hugh Van Dusen[illegible]

[illegible]Sam[illegible]Ben[illegible]

[illegible]

[illegible]